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# USSR Report

MILITARY AFFAIRS



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MILITARY-POLITICAL ISSUES

ADM SOROKIN CELEBRATES ROLE OF PARTY, GLAVPU IN WW II

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 9, May 85 (signed to press 19 Apr 85) pp 9-17

[Article by Adm A. Sorokin, first deputy chief of the the Main Political Directorate of the Soviet Army and Navy: "The Party Is Our Military Leader"]

[Text] The Soviet people, our friends and allies abroad and all of progressive mankind are celebrating the 40th anniversary of the Great Victory over fascism. "This day," Comrade M.S. Gorbachev, General Secretary of the CPSU Central Committee, stressed, "personifies the profound respect felt for the unparalleled feat performed by the Soviet soldier, by our people and the Communist Party."

The CPSU's guiding and mobilizing strength was manifested with particular force during the last war. With its multifaceted work it achieved firm unity of political, state and military leadership, of the army and the people, the front and the rear. At its appeal the entire nation rose in mortal battle against fascism. The Communist Party was truly a fighting party.

The period of time separating us from the events of 1941-1945 makes it possible to see with ever increasing clarity the grandeur of the unparalleled feat performed by the Soviet people under the leadership of the Communist Party. In the mortal engagement with imperialism's most reactionary and aggressive forces, the Soviet people and our glorious Armed Forces not only defended the honor, freedom and independence of their socialist homeland, but also saved world civilization from the danger of the brown plague.

The victory over mankind's most evil enemy, German fascism, to the achievement of which the Soviet Union made the crucial contribution, was of worldwide historical significance. It opened up the path to freedom, independence and social progress for many peoples and resulted in a basic altering of the balance of class forces in the international arena--the position of the champions of social progress, democracy and peace was strengthened, and the influence of communist and workers' parties grew. The world socialist system came into being and has successfully developed. The breakdown of imperialism's colonial system was accelerated, culminating in its collapse. Imperialism was deprived of the possibility of determining the fate of peoples with impunity and can no longer fail to consider the strength

of nations in the socialist commonwealth, their active peace-loving foreign policy or the international solidarity of forces of peace and progress.

The Communist Party focused all of its organizational genius, all of the strength of the powerful fraternity of peoples of the USSR, all of the energy accumulated by the working masses over the years, their determination, stamina and powerful will on achieving the common goal, the enemy's utter defeat. We know that things went extremely badly for our nation at the beginning of the war. Subordinating the economy of all Europe to their aggressive goals, concentrating their superior forces on the main strategic axes in advance, forces with 2 years of experience in fighting a war, and taking advantage of a surprise attack, the German fascist strategists did not doubt that their "campaign to the East" would be successful. Putting an unprecedented concentration of personnel and equipment into the first strike, they were confident that they would win the war with a brief summer campaign. This was the plan of the fascist leadership.

Placing their hopes on a blitzkrieg war against the USSR, the fascist leaders demonstrated a total lack of understanding of the nature of the socialist system and of the sources of the force and strength of the Soviet State and its Armed Forces. The mathematical calculation of the ratio of material capabilities in combination with treachery but without considering the socio-political and spiritual factors of the socialist state was found to be thoroughly erroneous when it came to the test.

When it roused the people for the Patriotic War against the aggressor, the Lenin party proceeded from the premise that the war would be won by the one with the greatest reserves, the greatest sources of strength, the people with the greatest endurance. From the first days of the war it assumed full responsibility for the fate of the socialist homeland and the outcome of the war thrust upon us by fascism. The Appeal to the Soviet People, the 29 June Directive from the USSR Council of People's Commissars and the Central Committee of the VKP(b) [All-Union Communist Party (of Bolsheviks)] to Party and Soviet Organizations of Oblasts on the Front and I.V. Stalin's 3 July 1941 speech demonstrated with exhaustive thoroughness the great danger hanging over the nation, revealed the just nature of the war for the Soviet State and the requirements for winning a victory, and defined the people's tasks. The program worked out by the party and the slogan "Everything For the Front, Everything for Victory!", which it advanced, became the Soviet people's combat banner in the Great Patriotic War.

The CPSU based all of its work of directing the struggle against the German fascist invaders on Lenin's demand that during periods in which the fate of the nation and the people is determined by warfare, "the warring party is the ideal of the party of the proletariat" ("Poln. sobr. soch." [Complete Collected Works], Vol. 14, p 8").

To begin with, the Communist Party reshaped its own forms and methods of working to conform to the wartime conditions. This reshaping involved intensifying organizational centralism, redistributing party forces and increasing the discipline and the personal responsibility of every communist for the fulfillment of party decisions. Changes were also made in the structure of the party and state organs.

The establishment, by decision of the USSR Council of People's Commissars and the VKP(b) Central Committee, of Headquarters, High Command of the Armed Forces of the USSR, later renamed Headquarters, Supreme High Command, played an enormous role. It was in direct charge of combat operations of the army and navy and of the partisan forces, and had appropriate reserves at its disposal. On 30 June the Presidium of the USSR Supreme Soviet, the VKP(b) Central Committee and USSR Council of People's Commissars made a joint decision to establish the State Defense Committee (GKO), with all power in the nation and state, military and economic leadership concentrated in it.

The GKO adopted and put into effect around 10,000 directives and decrees during the war. This did not take the place of nor weaken the leading role of the VKP(b) Central Committee in directing the armed struggle and in determining the Soviet State's foreign and domestic policy, however. The GKO based its decisions on party documents, and many issues were discussed at joint conferences of members of the Politburo and the GKO or the Politburo and Headquarters, with the involvement of people's commissars, workers in the Council of People's Commissars and USSR Gosplan, commanders of fronts, services of the Armed Forces and branches of troops. The system of directing the nation which was developed during the first months of the war, coordinated and cemented by a single will and iron discipline, passed all the tests of that difficult time.

From the first days of the war, the party strengthened its influence there where the fate of the war was being determined, at the front. A large number of leading party workers were drafted into the army and navy, including around half of the members and candidate members of the VKP(b) Central Committee and 270 of the workers in charge in the party Central Committee's apparatus. The party stratum in the army and navy was also strengthened by the individual mobilization of leading workers. The party covered all personnel of the Armed Forces with its ideological and organizational influence through the party organizations of units and ships.

The work style of the political organs was restructured in accordance with the wartime demands. The forms and methods which contributed the most to strengthening party influence on the life and combat work of the personnel were adopted. The reorganization of the Main Directorate of Political Propaganda of the Red Army into the Main Political Directorate of the RKKA [Workers' and Peasants' Red Army] (GlavPURKKA) helped to raise the level of supervision of the party-political work. Corresponding reforms also took place in the central political organ of the Navy.

The Military-Political Propaganda Council was established under the GlavPURKKA in June of 1942 by decision of the VKP(b) Central Committee. It included certain members of the party Central Committee and leading workers in the Main Political Directorate. The council studied and summarized party-political work and worked out recommendations for the political organs in accordance with the situation which had developed at the fronts and with the specific features of the missions being performed by the fronts and armies. Working among the population in temporarily enemy-held territory and among the enemy population and forces occupied an important place in its work.



Such distinguishing features of party leadership as its profoundly scientific nature, its revolutionary vigor and purposefulness, its specific and realistic nature, its firmness and steadfastness in achieving the assigned objectives were brilliantly manifested during the difficult wartime. The party specified ways to achieve the comprehensive resolution of the extremely difficult national economic problems facing the nation and implemented a number of extremely important measures for mobilizing all forces to repel the enemy. Material and technical, financial and labor resources were redistributed in the interest of munitions production. An unprecedented relocation not just of enterprises (and 2,593 of them were evacuated during the second half of 1941), but of entire branches of industry, was accomplished. The evacuation took place under enemy fire and in a situation of extensive counter-shipments for the front. The relocation of the munitions industry over thousands of kilometers under those difficult conditions was an unparalleled labor feat performed by our people. It speeded up the conversion of the nation's eastern regions into a powerful arsenal of the Soviet Armed Forces.

Lost capacities of the munitions industry had been not only restored, but significantly increased by mid-1942. By the end of the first period of the war the USSR already had a smoothly organized munitions industry, which was providing the front with an ever increasing volume of weapons and combat equipment. The world had never before seen military-economic tasks performed at such a pace and on such a scale.

The agrarian sector of the Soviet economy also passed some serious tests. Despite the fact that our agriculture lost considerable areas of cropland during the war, its most skilled workers went to the front and the material base of the kolkhozes and sovkhozes was drastically weakened, the party managed to mobilize all forces to provide the front and the rear area with an interrupted supply of food and industry with essential raw materials. The collective handling of the farming and the selflessness of women and adolescents made it possible to successfully accomplish this task under the wartime conditions.

Our economy, based on public ownership of the means of production and with a planned basis, demonstrated unprecedented vital force and dynamism. While smelting one-third as much steel and extracting one-fourth as much coal as fascist Germany, the USSR produced almost twice as much equipment and weapons during the war. The party's skillful consideration of the advantages of the socialist economic system and of the natural superiority of our economy was graphically demonstrated in this.

Under the difficult wartime conditions the party demonstrated great concern for the scientists and designers, engineers and technicians, workers in education and public health, literary figures and artists. The Central Committee and local party organs directed their creative efforts toward new scientific discoveries and toward the development of the world's best weapons and combat equipment. Our intelligentsia honorably fulfilled their patriotic duty, winning one of the most difficult battles--the battle of minds.

Socialist competition assumed great scope during the war. Workers, peasants and the intelligentsia gave their all to the achievement of victory over the enemy. The elderly, women and adolescents took their places at the machine tools and at the controls of tractors. This was a convincing demonstration of the social and the moral-political unity of all classes and strata, of all generations of the Soviet society. The mass labor enthusiasm and heroism of the Soviet people provided the powerful source of our economy's internal strength. The advantages of socialist production relations were manifested most fully as a result of the Communist Party's leadership and its organizational and indoctrinational work.

The Soviet people's struggle against the Hitlerite invaders was more than just a military and economic struggle. It was at the same time a struggle between two irreconcilable ideologies, socialist and fascist. The party therefore attached enormous importance to ideological work. Its main objective consisted in mobilizing the Soviet people's spiritual strength to defeat the enemy, enhancing responsibility for the fate of the world's first socialist state and instilling a readiness to overcome all difficulties and deprivations for the sake of victory. The party followed Lenin's instruction that victory in any war is ultimately determined by the morale of those masses who shed their blood on the field of battle.

Great importance was attached to the propagandizing of Lenin's ideas on protecting the socialist homeland and to indoctrinating the Soviet people and fightingmen of the army and navy in the revolutionary, combat and labor traditions of the peoples of the USSR and of its Armed Forces. The party explained the just, liberating nature of the Great Patriotic War and indoctrinated the workers and fightingmen of the army and navy in a spirit of socialist patriotism, proletarian internationalism and friendship of peoples.

The party performed the ideological work actively and on a differentiated basis, taking into account the military-political situation and the missions being performed by the front and the rear area at various stages of the war. The Central Committee headed and directed that work. Around 40 ideological issues were considered in its organizational bureau during the war, and more than 50 in the Secretariat. Problems having to do with the ideological and political indoctrination of the masses were discussed at more than half of the plenums of the republic communist party central committees, kraykoms and obkoms during that period. The work of the mass media, the press and radio, was reorganized when the war began. The Soviet Information Bureau operated under the immediate supervision of the party Central Committee. It regularly informed the population on the military-political situation and the heroic deeds of the Soviet people at the front and in the rear, and gave the lie to fascist propaganda.

Marxist-Leninist ideology, which became available to millions of Soviet people, became their powerful spiritual weapon which won the victory over fascism's misanthropic ideology. Our people's ideological conviction that the party's cause would triumph and their conviction that the socialist social and state structure was the correct one, the real benefits of which the workers knew from their own experience, were demonstrated during that



time of great trials. This is why they defended their homeland, sparing neither their strength, their blood nor their very lives. Remember the heroes of the Brest Fortress, the feats of the fightingmen who covered the embrasures of enemy earth-and-timber placements with their bodies and those who turned themselves into fiery rams. The great patriotic feelings of the Soviet people and their infinite love for the homeland were reflected in these acts like the sun in a drop of water.

The main and determining focus in the party's work during the first years of the war was that of thoroughly strengthening the Armed Forces, outfitting them with the latest equipment and weapons, perfecting the skill of the personnel, preparing reserves, vitalizing party-political work and directing combat operations. The army's numerical strength was doubled during the initial period of the war. Around 10 million people received universal militarized training during the period 1941-1945, and 20 million soldiers, commanders and political workers poured into the ranks of the army and navy.

The party devoted an enormous amount of attention to the preparation of military cadres--commanders, political workers, engineers and technicians. As a result, the party and government enlarged the system of military educational institutions, increased admissions to them and set up more than 200 different courses. Our Armed Forces received 400,000-500,000 officers annually between 1942 and the end of the war.

The party thoroughly supported the development of advanced military thought and creative initiative in the command and political cadres and demanded that everything valuable produced by the fighting experience in the war be constantly taken into account and extensively applied at the practical level. A galaxy of outstanding Soviet army and navy leaders, political chiefs and political workers were produced as a result of this.

The VKP(b) Central Committee and the GKO set forth the tasks involved in military organizational development in good time, considered and resolved questions pertaining to strategic operations, specified the axes for the main thrusts, assigned problems which arose to military science and strove to see that new procedures and forms of armed struggle were applied at the practical level.

Soviet forces conducted a large number of extensive defensive and offensive operations. The battles fought at Moscow and Stalingrad and on the Kursk Salient, operations conducted in the Ukraine and in Belorussia, the Baltic and Polar regions, the Jassy-Kishinev, Berlin and other operations were unprecedented with respect to their scale and the military-political results. History convincingly confirmed the vitally important role of Soviet military science in the development of the praxis of preparing for and conducting combat operations.

One of the most important tasks during the war was that of achieving foreign political conditions conducive to defeating the enemy. Far-sighted steps taken by the party eliminated the need for the USSR to conduct a war on two

fronts. We succeeded in creating an anti-Hitlerite coalition and in forcing the allies to open a second front against Hitlerite Germany--although the latter was enormously belated. The cooperation among states with different social systems for restraining the aggressor is experience of permanent historical value. It is still important today and can be effectively used for purposes of preventing a nuclear war.

The Soviet people are highly grateful for everything done to achieve victory by our allies, by all the antifascist forces. It is an absolute fact, however, that the Soviet people and their Armed Forces made the decisive contribution to the defeat of fascist Germany and militaristic Japan, to the saving of world civilization and the creation of favorable conditions for the workers' struggle for their social and national liberation. Therein lies their great service to mankind. And no sort of lies by bourgeois propaganda, no sort of schemes by falsifiers of the history of World War II can conceal the truth from peoples or belittle the importance of our liberation mission or the enormous vital force of the socialist system.

The Central Committee considered increasing the role and responsibility of the political organs and party organizations and intensifying party influence in the forces to be an extremely important condition for strengthening the army and navy. It strove to see that the substance of the work and the structural forms of the political apparatus and of party organizations in the army and navy were inseparably linked with the missions being performed by the troops. Because of this, the structure and the forms and methods of their work were improved as the war proceeded. The complex military situation at the beginning of the war made it necessary to introduce an extraordinary form of party leadership, the institution of military commissars, in the Armed Forces. They gave the commanders a great deal of help in strengthening the fighting efficiency of the troops in the first and most difficult stage of the war. In October 1942, when the commanders had acquired experience in directing the combat work and indoctrinating the personnel, the institution of military commissars was abolished and replaced by the institution of deputies for political affairs..

The most typical feature of party life during the war years involved enhancing the avant-garde role of the communists. They were in the most difficult sectors involving the greatest responsibility. Tens of thousands of the best trained communists and Komsomol members entered the army as political fighters. With the status of rank-and-file Red Army men, they united the personnel and were models of service to the homeland at the hour of greatest danger. "The political fighter," PRAVDA wrote, "leads those who are not party members. The communists and Komsomol members are the primary supporters of order and discipline. They are a model of endurance, calmness, boldness and initiative in battle."

While there were 13 communists for every 100 fightingmen at the beginning of the Great Patriotic War, the number was 25 by the end of the war. Army and navy party organizations were the force which cemented the ranks of fightingmen and gave our forces indestructible ideological solidarity and steadfastness in combat. With their Bolshevik words and personal example the communists inspired the homeland's defenders to perform military feats and strengthened their faith that our just cause would be victorious. "Forward, communists!"--this burning appeal rang out during the most difficult moments of a battle, in the most critical situation.

The communists inspired the Soviet people and led them to the Victory with their personal example and their passionate party word. Almost three quarters of the men who set the highest examples of valor and were awarded the title Hero of the Soviet Union for this were communists.

The war fully confirmed the fact that a people and an army led by a Marxist-Leninist party and closely united round it are invincible. The invincibility of our just cause is assured today by the strength of the developed socialist society and the entire socialist commonwealth.

In the contemporary situation the party cannot ignore the explosive international situation exacerbated through the fault of aggressive imperialist circles led by the USA. The arms race caused by them and the increased danger of a nuclear war make it incumbent upon our party in the conduct of its military policy to objectively analyze and consider the interdependence of various international factors helping to shape the development of the military-political situation in the world.

Our party is actively fighting to prevent a new world war. Its clear and consistent foreign policy course enjoys the support of the entire people. One of the concerns of the party and the state is that of preserving the fraternal friendship with nations of the socialist commonwealth and strengthening it in every possible way. The special March 1985 Plenum of the CPSU Central Committee stressed once again the fact that we shall do everything which depends upon us to expand interaction with the socialist states and to enhance the role and influence of socialism in world affairs. The common resolve to continue perfecting our all-round political interaction and economic, ideological and other kinds of cooperation and to further strengthen the Warsaw Pact Organization is of great importance. From the time it was founded the defensive military-political alliance of socialist nations, which will be 30 years old on 14 May, has served as a strong bastion of security in Europe and as an instrument for the protection of peace on the entire planet. All of the Pact participants have spoken out in favor of extending its effective period.

The Soviet Union has never attempted and is not now attempting to achieve strategic military superiority over the capitalist nations. It will always respond to good will with good will, to trust with trust. Our party and the Soviet people will never abandon the interests of the homeland and its allies, however. It was pointed out at the special March 1985 Plenum of the CPSU Central Committee that in the complex international situation it is important as never before to maintain our homeland's defense capability at a level which lets the imperialist aggressors know that an encroachment upon the security of the Soviet Nation or its allies, upon the peaceful life of the Soviet people, will be met with a devastating retaliatory strike. The glorious Armed Forces of the USSR will continue to have at their disposal everything necessary for this.

Our people and personnel of the Soviet Army and Navy fully approve of this principled position. Soviet fightingmen unanimously support and approve of the CPSU's foreign and domestic policy. Closely united round the Communist Party, they are doing everything possible in the complex and dangerous international situation to defend in a worthy manner the peaceful labor of the Soviet people



and the gains of socialism. Every Soviet person thoroughly understands that the times demand intense, creative work and monolithic unity under the banner of our Lenin party. We have become convinced from the experience of decades that the CPSU is that force which is capable of considering the interests of all classes and social groups, all of the country's nations and ethnic groups, of uniting them into one and mobilizing the people's energy for the common cause of creating communism. The party's strength lies in its solid, monolithic unity with the people, and the people's strength lies in their unity with the party and in the party's tested leadership.

The CPSU's increasing role in providing a reliable defense for the homeland and the gains of socialism is also a result of the increasing complexity of the organizational structure and the technical equipment of the troops and naval forces, of the need for further creative development of Soviet military science and military art in accordance with the modern demands, and of the expansion and intensification of the international missions of the Soviet Armed Forces. Also, of course, it is a result of the increased role of the spiritual factor in maintaining a high level of combat readiness and fighting efficiency for the army and navy.

We know that the rapid development of military equipment and weapons is in no way reducing the importance of people. Furthermore, the role of each individual fightingman in the achievement of victory over the enemy is increasing immeasurably. The conduct of every serviceman in a combat situation and in the daily training and service work must therefore be defined by good morale, ideological conviction, an understanding of his personal responsibility for the fate of the homeland, and discipline. There is a reason why the work of the military councils, commanders, political organs, party and Komsomol organizations is based on the CPSU Central Committee's demands for the further strengthening of discipline and the enhancement of organization.

V.I. Lenin instructions to the effect that iron discipline taken to the highest limits is essential in the army are especially valid today. The need to be in a state of readiness for immediate responsive actions, the complexity of the weapons and combat equipment and new problems in the control of the troops and naval forces are drastically increasing the demands of their mobility and organization and of the efficiency of every fightingman.

Experience has demonstrated that a high level of discipline on the part of the personnel is achieved when the ideological-political and organizational work is performed in inseparable unity with the struggle for precise fulfillment of regulation requirements, when the indoctrinating and persuading of the servicemen are backed up by demandingness and strict verification of performance, by bringing the training, the service and the entire structure of military life into exact conformity with the letter and spirit of the regulations. Where the combat and political training and the performance of alert duty, guard and internal service meet the demands contained in the regulations and those of the minister of defense, the personnel are sharp, self-disciplined and efficient. The military councils, commanders, political organs and party organizations unquestionably have the determining role in the creation of such a situation. A realistic, creative approach, nonacceptance of shortcomings and day-to-day attunement to the

job are becoming increasingly solidly established in their work. They work constantly to see that decisions coming out of the 26th CPSU Congress and subsequent plenums of the party Central Committee and the tasks set for the Armed Forces with respect to enhancing combat readiness are successfully fulfilled.

The Komsomol organizations, which include most of the personnel in the Armed Forces in their ranks, are always a reliable support for the commanders and political workers. There is no more important or crucial a task for our army and navy Komsomol, which has been awarded the Red Banner Order, than that of activating the strength, vigor and will of the youth for the skilful mastery of military affairs, the enhancement of discipline and organization and the exemplary fulfillment of the constitutional duty.

The communists and Komsomol members set the tone in the socialist competition, which has the slogan: "For the 40th Anniversary of the Great Victory and the 27th CPSU Congress—Our Selfless Military Labor!". The number of outstanding servicemen, rated specialists and masters of the combat occupations has grown in the course of the competition. The task is one of preserving the intensity of the competition, of assuring exemplariness in the training and service of the communists and Komsomol members by trying to measure up to those out front.

Fightingmen of the army and navy, like all the Soviet people, fervently approve of decisions coming out of the April 1985 Plenum of the CPSU Central Committee. The plenum's resolution on the convening of the next, 27th CPSU Congress and on the tasks involved in preparing for and conducting it is inspiring army and navy communists, all of the personnel of the Armed Forces, to further enhance vigilance and combat readiness.

In the course of actively preparing for the party congress, commanders, political organs, party and Komsomol organizations are mobilizing the fightingmen for the achievement of new and higher goals in their combat improvement. They are indoctrinating the personnel in the immortal concepts of Marxism-Leninism, in a spirit of unshakeable communist conviction, Soviet patriotism, friendship among peoples of the USSR, socialist internationalism and strong military comradeship. The combat traditions of the army and navy are being actively utilized in the indoctrinational work. The present generation of defenders of the homeland are carrying the baton received from their fathers and grandfathers in a worthy manner and meticulously fulfilling the demands contained in the military oath. They value the honor and the combat glory of the Armed Forces.

The Soviet fightingmen, closely united round the Communist Party and proud of their Soviet homeland, are filled with resolve to greet the 27th CPSU Congress in a worthy manner. All of the Soviet people and the army and navy fightingmen measure their deeds and plans against decisions of the Lenin party. Its tested leadership reliably assures that the Armed Forces of the USSR will continue to honorably carry out their historical mission of vigilantly guarding the peaceful, creative labor and the security of the Soviet people and the great gains of socialism.

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WARSAW PACT

REVIEW: BUILDING ARMED FORCES OF EAST EUROPE

Moscow KOMMUNIST VOORUZHENNYKH SIL in Russian No 9, May 85 (signed to press 19 Apr 85) pp 90-92

[Review by Col N. Martsikh, candidate of historical sciences and docent, of the book "Stroitelstvo armiy yevropeyskikh stran sotsialisticheskogo sodruzhestva. 1949-1980" (The Organizational Development of the Armies of the European Socialist Commonwealth Nations, 1949-1980), Nauka, Moscow, 1984, 310 pages]

[Text] This monograph, prepared by a group of Soviet military historians, provides a study of the multifaceted process of building the fraternal armies of the European socialist commonwealth nations. It is a logical sequel to the book "Zarozhdeniye narodnykh armiy stran-uchastnits Varshavskogo Dogovora 1941-1949 gg." [The Origin of the People's Armies of the Warsaw Pact Nations, 1940-1949], also published by the Nauka Publishing House.

This book is the first in Soviet historiography to provide a comprehensive study of the history of the organizational development of the socialist type of armies in the fraternal nations of the Warsaw Pact Organization. Structurally, the monograph consists of an introduction, seven chapters, a conclusion, a bibliography and an index of names. Contrary to the time frame indicated in the book's title, it also covers later years, including events of 1984 in a number of cases.

Interest in the experience of building the socialist armies is due to more than just a desire for knowledge. As the work points out, summarizing the experience of the communist and workers' parties in enhancing the combat readiness of the armies will help to strengthen the Warsaw Pact, a defensive military-political alliance which has guarded the security of the socialist nations for 30 years now.

Thoroughly analyzing the historical conditions for the building of the socialist nations' armies, the authors point out that the need to protect the socialist homeland and the revolutionary gains of socialism resulted from the constant threat of armed imperialist invasion of nations of the victorious socialist revolution and from attempts by the imperialist powers to set up a blockade and arrange political and diplomatic isolation in the international arena, as well as from the possibility of armed actions by internal counterrevolution. The establishment and strengthening of the socialist nations' armies was a forced process in response to the intrigues of imperialist circles, to attempts by the bourgeoisie to regain their lost status by force.

The monograph thoroughly reviews the patterns and principles underlying the organizational development of the socialist state's army, which were revealed and scientifically substantiated by V.I. Lenin. Particular attention is given to demonstrating the most important laws underlying the vital functioning of the socialist armies, their direction by the Marxist-Leninist parties and the constant enhancement of party influence upon all aspects of the life and work of the armed forces. Of the three groups of principles--sociopolitical, organizational and the principles of training and indoctrination--the sociopolitical principles are the decisive ones. The authors describe the following sociopolitical principles: party leadership, the class nature of the army, unity of the army and the people, the aware fulfillment of military duty and proletarian internationalism. Among the organizational principles, the book singles out the following: the organizational development of the army as a regular, cadre army, the balanced development of all services and branches of the armed forces, the maintaining of the army at a constant level of combat readiness to repel aggression, centralism and one-man command. The most important of the principles involved in the training and indoctrination of personnel in the armed forces of the socialist states are a high level of communist conviction and awareness and the teaching of the troops that which is essential in modern warfare.

The development of all the fraternal armies has been based on the Leninist laws and principles. Military organizational development in each of the fraternal socialist nations has its own peculiarities and specific features, however. This is convincingly demonstrated in the subsequent six chapters of the monograph, each of which covers the most important aspects of the development of one of the armies: the Bulgarian People's Army (BNA), the Hungarian People's Army (VNA), the National People's Army of the GDR (NNA GDR), the Polish Army, the Army of the Socialist Republic of Romania (the Army of the SRR) and the Czechoslovak People's Army (ChNA).

Each of these armies has grown stronger with the development of its state and the socialist commonwealth as a whole. The authors of the monograph therefore identify with complete justification three periods in their organizational development, which correspond to the stages in the building of socialism in the fraternal nations. The first embraces the period of building the foundation for socialism; the second, the completion of the process of building the foundation for socialism; and the third, the transition to the building of the developed socialist society.

During each period in the building of the fraternal armies, as the book demonstrates, the communist and workers' parties gave priority to strengthening their guiding role in the armed forces and enhancing their influence upon all aspects of their development, life and work. A well-balanced system of party organs was created and strengthened in the armed forces. Problems of improving their organizational structure and technical equipment, training military cadres, training and indoctrinating the personnel, strengthening cooperation with the fraternal armies and enhancing the combat capability of the national armed forces and the Joint Armed Forces of the Warsaw Pact States were resolved under the leadership of the communist parties.

The book provides a vast amount of material on the use of the experience of Soviet military organizational development by the fraternal nations and on the Soviet Union's all-around assistance to those nations in the development and strengthening of armies of the socialist type. The USSR's assistance with the outfitting of the friendly armies with weapons and combat equipment and with the training of military cadres was particularly important. While accomplishing the tasks involved in the building of armies of the new type, the communist and workers' parties of the fraternal nations also enriched themselves with the know-how of the others and relied upon that which had already been achieved in the military work during the years which had elapsed since the popular democratic revolutions.

The monograph convincingly demonstrates the fact that military organizational development in the fraternal nations was not just a particularly important matter, but an extraordinarily difficult one as well. They had to surmount great difficulties resulting from the legacy of the past, from the economic backwardness of a number of nations, from military ruin, a lack of cadres and intrigues by imperialist and internal counterrevolutionary forces and by opportunistic and revisionist elements. In addition to this, the building of the new type of armies was begun in a complex international situation, under the conditions of the "cold war" launched by imperialist circles of the USA and their allies against the USSR and the popular democratic nations, a growing military threat and the consolidation of imperialism's military efforts, which led to the establishment of the aggressive NATO military bloc in 1949.

In response to imperialism's militaristic preparations, the fraternal socialist nations were forced to accelerate the building of their own armed forces. The process of building armies of the new, socialist type had been completed in most of the European nations of the socialist commonwealth by the mid-50s as a result of a system of measures carried out under the leadership of the communist and workers' parties. Up to the spring of 1956, the armed protection of the democratic gains in the GDR was performed by such bodies as the Garrisoned People's Police and workers' combat detachments. The threat to the security of the socialist German state and the cause of peace and socialism in Europe increased when the FRG joined NATO in 1955. In that situation the Socialist Unity Party of Germany and the government of the GDR took a number of steps to strengthen the nation's security and to create the National People's Army. Its first military unit had been formed by the spring of 1956. The first day of March was made National People's Army Day.

The system of collective security for the socialist nations was also improved. Prior to the concluding of the Warsaw Pact, it was based on bilateral treaties and agreements between the Soviet Union and the other socialist nations, as well as between the latter. This system in turn had an extensive positive effect upon the building of each of the armies of the socialist commonwealth nations.

The second period in the building of the fraternal armies, the book shows, involved mainly their reorganization and the further strengthening and enhancement of their combat readiness. The authors direct the reader's attention to the fact that the process of strengthening the armies during that period directly involved not only important advances in the development of each of the nations, but also the further unification of the entire socialist commonwealth and improvement of the collective security system.



A qualitatively new stage in the building of the fraternal armies and in the development of their cooperation set in with the concluding of the Warsaw Pact. Upon becoming a member of the socialist defense organization, each of the nations had its international security guaranteed. At the same time, each of the Warsaw Pact Organization nations assumed increased responsibility and obligation both for the further strengthening of the defense alliance of socialist nations and for enhancing the combat efficiency and the combat readiness of its state's armed forces.

Thoroughly analyzing the building of the fraternal armies under the conditions of the third, contemporary period, the authors give their chief attention to describing the leading role of the communist and workers' parties in the military organizational development. In connection with this, the book studies the process of perfecting the system of political organs and party organizations in the armies and cites data on the growth of the party stratum. For example, 85 percent of the officers in the Bulgarian People's Army are members of the Bulgarian Communist Party, and 82 percent of the officers and 36 percent of the sub-officer personnel in the Hungarian People's Army are members of party organizations.

Due to the efforts of the communist and workers' parties, a system of military educational institutions was created, which turn out highly skilled military cadres. For example, 67 percent of the officers in the Polish Army, 70 percent of the officers in the Bulgarian People's Army and 90 percent of the officers in the Hungarian People's Army have a higher education. Many specialists have been trained at Soviet military educational institutions. Around 3,000 Bulgarian generals and officers have obtained a high level of military expertise at Soviet VUZ's during the 30 postwar years alone. The number of officers from among the workers and peasants has increased considerably. They account for more than 76 percent of the officers in the Army of the Socialist Republic of Romania and the Czechoslovak People's Army, for example.

The monograph also presents a study of such an important aspect of military organizational development as the outfitting of the armed forces with modern combat equipment and weapons, which was made possible by the constant increase in the economic power of the world socialist commonwealth and the development of science. Direct deliveries of the latest combat equipment and weapons from the USSR and their production under Soviet license have had a large role in this process.

The organizational structure of armies of the socialist commonwealth nations is being improved, and their fighting efficiency and combat readiness are constantly being enhanced. This is borne out by the results of numerous exercises conducted according to the plans of each army's command element and under plans of the command element of the Joint Armed Forces of the Warsaw Pact Nations.

Many pages in the monograph--and this is perfectly natural--are devoted to revealing the enormous importance which is attached to the strengthening of mutual cooperation in the fraternal armies and in the Soviet Armed Forces. This cooperation embraces all areas of military organizational development and has many different forms. The authors analyze them and show that all of the forms of cooperation are helping to further strengthen the defense capability of armies of the Warsaw Pact nations.

The book exposes the bourgeois falsifiers of history, who, by distorting the nature of the socialist armies and the process of their shaping and development, are actively pursuing the course of "psychological warfare" launched by reactionary circles in the USA against socialism.

The monograph's high ideological-theoretical level, the preciseness of its conclusions and generalizations and the scientific and intelligible manner in which the material is presented are of unquestionable merit. The group of authors has succeeded in accomplishing the complex task facing them, of preparing a fundamental work which will be greeted with interest by the military reader. The book teaches fightingmen in the armies of the Warsaw Pact nations to vigilantly guard the revolutionary gains of socialism.

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- \* French 155-mm Self-propelled Cannon AU F1
- \* AGM-86B Cruise Missile
- \* American Shore-based ORION P-3C Patrol aircraft
- \* Canadian Destroyer IROQUOIS

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FOREIGN MILITARY AFFAIRS

JAPAN'S MILITARY PREPAREDNESS DESCRIBED AS REVANCHISM

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 9-13

[Article by Col V. Snegov; "Japan's Military Preparedness"]

[Text] In 1984, the Japanese Cabinet approved a serially prepared White Paper on the UNO (upravleniye natsionalnoy oborony = National Defense Establishment), the contents of which adequately outline the views of the country's ruling circles on various aspects of defense policy and the military buildup. Like numerous other propaganda publications found on bookstall shelves, the White Paper is published with the aim of justifying before the world community and the Japanese people the militarist, revanchist course of the Nakasone government, which in concert with the American administration is actively increasing military readiness, posing a threat to peace and security in the Far East.

In assessing the development of the politico-military situation in the Asian-Pacific region and in the world as a whole, the Japanese defense leadership is ignoring the peaceful overtures of the Soviet Union and has the common support of NATO and the United States, which have been worked out at meetings of the heads of the leading capitalist countries in Williamsburg (1983) and London (1984). Leading off with pretensions concerning the USSR's ownership of the Kurile Island chain (Iturup, Zelenyy, Kunashir, Shikotan), tendentiously distorting the peaceloving foreign policy of the USSR and fraudulently mixing facts and figures, it continues to inflate the myth of a growing "Soviet military threat" as an argument for its ever-growing defense expenditures. Further, it supports the U.S. in implementing its policy "from a position of strength" and assists in the unification and growth of imperialism's "forces for intimidation" and for the "security of the free world."

These concrete acts by official Japanese leaders and press reports prove clearly that in its policies the country is being led more and more towards arming and towards bringing to reality the concepts of the so-called "defense realists" (in Japan that is what they call defense ideologues, who consider that one must talk with the Soviet Union only from a "position of strength" under conditions of the imperialist coalition's all-round military superiority in both a global and regional sense). They are working up recommendations for

the government, related to reinforcing the contribution of Japan to strengthening U.S. and NATO military power, they are trying to obtain an overturn of the constitutional limitations, they favor unlimited arms exportation, renunciation of the three "nuclear principles," and propose to enact wartime legislation. The UNO actively supports these efforts.

To please reactionary forces, the UNO has opened up a real attack on those limitations pertaining to military buildup, which were established in the immediate postwar years. According to the statement of its leadership, Article 10 of the constitution, which renounces war and the possession of military capabilities, represents "ideal pacifism." Criticizing the present constitution, it treats its separate condition in a light favorable for military force. In particular, the principal characters in this area strongly claim that the constitution does not restrict the right to self-defense and consequently does not forbid the government to maintain necessary military force. Therefore, Japan has created armed forces and raised their military capacity, but the readiness of its groups and units is oriented virtually exclusively to defensive actions.

At the present time, these constitutional conditions do not suit the "hawks" of military and government circles. They would like to overturn completely the constitutional provisions, saying "The wording--the guidance solely on defense--is unclear. It can denote a passive defensive strategy, that is, the use of armed force only in the event of an attack on Japan and limits military capability to a level necessary for defense." Here, those favoring revision of the constitution, employ the phrase "can denote," rather than "denotes," and consequently presume a different interpretation. And what, precisely, is said about this in one chapter of the White Paper: "The possession of military power is a means of demonstrating the will and readiness of the Japanese people to defend freedom and independence, peace and security and prosperity of the nation. The role of "self-defense forces," in the framework of the Japanese/American Treaty on Mutual Security in conjunction with the armed forces of the U.S., including their nuclear forces, is to "demonstrate intimidation".

In this and several other publications, foreign specialists detect a whole string of new conditions which testify to Japan's further movement to the right. The state of relations between the Reagan and Nakasone governments serves in particular to underscore this view; that the U.S. demands that Japan increase its defense allocations and Japan blindly carries out its partner's orders. Constant growth of military expenditures in the Land of the Rising Sun has become a reality. For example, in 1983, they were 2,754.2 billion yen (about \$11.5B U.S.) and in 1984, they rose to 2,934.6 billion yen, an increase of 6.55 percent. Relative to the overall budget, their share went from 5.5 percent in 1983 to 5.8 percent in 1984. But this is still too little for the U.S. administration. A well-known defense analyst, Kh. Maeda has pointed out: "The USA wishes our country to view the world with American eyes. Under the pretext of the "Soviet military threat," they are attempting to bring about growth in Japan's military strength. In blind agreement with this thesis, our defense policies have, however, not strengthened the nation's security." He further deduces that American military power, which must defend the Japanese, actually exposes Japan to serious nuclear danger.



It is well known that the national defense establishment (UNO) attempts to conceal the actual amounts of financial resources dedicated to defense purposes; accordingly in 1978, they refused to construct five-year plans for armed force structure, giving instead hard estimates of expenditures and moving ahead toward working up a mid-range program, where the budget is changed and modified annually. This made it possible, in the view of foreign specialists, to approximate to a considerable degree the target figures, laid out in the "principal aspects of the defense plan," ratified by the cabinet in October, 1976. These "aspects" anticipated the creation of so-called "base forces," that is, peacetime forces with a corresponding organizational structure and weaponry, which could be converted in the event of war into a strong, modern army. By now, judging from information of the Western press, these forces have in all practicality been established and their qualitative improvement has begun.

Not only that, but reactionary circles in Japan are stubbornly trying to achieve widespread militarization of Japan's economy. In particular, the UNO is intent on subordinating to its influence construction, transportation, communications, science and technology, and also proposes to strengthen defense aspects in the affairs of civilian institutions even in peacetime. In other words, it is demanding to prepare the economy for war, to broaden the base of contemporary weapons production, to create strategic reserves of raw materials, foodstuffs, etc. A problem is then posed to the military specialists on how to establish a new formulation of laws, relating to "self-defense forces" and to the activities of the UNO civilian ministries and offices as well as to the mechanics of their actions in extraordinary situations.

The ruling liberal-democratic party, which is also trying to increase military readiness, is in lockstep with these forces. In particular, the force structure subcommittee of the LPD-party commission to study defense questions has "recommended" to the Nakasone government to lift restrictions on defense expenditures, and review the current defense program with an eye toward strengthening the warfighting capability of the "self-defense forces."

It is proposed that the central armed forces command post, put into operation in 1984, be used for the country's unified leadership in wartime. Ideas are being put forward for the regular conduct of governmental conferences at the ministerial level for the purpose of unifying and coordinating political, economic and military technical efforts in a wartime situation.

Japanese strategists are especially uneasy. they are demanding that legislation for extraordinary situations be drafted and enacted, and they are raising questions connected with military conscription. In their opinion, the system in use for manning the "self-defense forces," considering the increase in tempo of fitting out units and components with new weapons, cannot guarantee the necessary numbers of military-trained contingents, especially in enlisted specialists.



MAIN INDICES OF JAPAN'S ARMED FORCE STRUCTURE		
Formations, Units, and Military Equipment	Numerical Indices of Basic Force Composition	
	Control	1984 Year End
GROUND FORCES		
Division		
Infantry	12	12
Tank	1	1
Individual Brigades		
Mixed	2	2
Airborne	1	1
Artillery	1	1
Training	1	1
Air Defense Missile Divisions	8	8
AIR FORCES		
Air Squadrons		
Tactical		
Interceptors	3	3
Air Defense		
Interceptors	10	10
Reconnaissance	1	1
Long-Range Radar		
Reconnaissance	1	1
Transport	3	3
Air Defense Missile Divisions	6	6
Radar Stations	28	28
Combat Aircraft	430	354
NAVAL FORCES		
Flotillas		
Destroyer	4	4
Submarine	2	2
Mine Sweeper	2	2
Detached Ship		
Divisions	10	9
Major Surface Ships	60	56
Submarines	16	14
Air Squadrons	16	14
Combat Aircraft and Helicopters	220	146

Critical observations have appeared in the Japanese press in connection with the absence of any kind of progress in the area of civil defense. The systematic undertaking of civil defense measures forces a war psychosis in the country and convincingly demonstrates Japan's readiness for war. In addition there have been recommendations to unify efforts of the government, local authorities (prefectures) and the public in this given direction. All this is in pursuit of one goal--to prepare public opinion for the development of an organized system of civil defense in Japan.

Pointed questions have been raised about the necessity of enlarging production of its own forms of modern armaments and military technology. Foreign experts assess Japan to hold second place among the economies of the capitalist world, and capable of independent production of the newest types of weaponry and the UNO can effectively utilize the modern technology of private companies for conducting the research and development and the test and evaluation for their development.

As Japan, up to recent times, acquired weaponry from overseas (primarily from the United States) and then set up serial production in its own factories under license, so now, in the opinion of Japanese defense leaders, the time has come to produce their own armament, in light of the fact that they have achieved a high level of technology.

It is now proposed to direct their main effort towards designing new types of weapons, including tactical "surface-surface" and "shore--ship" missiles, fighter-bombers, highly maneuverable air defense fighters, air defense missiles capable of destroying highspeed air targets at any altitude, the newest tanks, field artillery, anti-tank, anti-ship and anti-submarine weapons, radar detection systems of long range and target locating accuracy, with improved capabilities for tracking, targeting and fire control and improved guidance systems, communications and ECM. Deploying new and complex types of weapons, Western specialists stress, involves changes in strategy and tactics, and allows working up in training and maneuver exercises more realistic attack operations "to destroy the enemy as far from Japan's shores as possible."

The Japanese defense buildup is taking shape along three sharply defined lines: a qualitative and quantitative improvement in military capabilities; an increase in "operational readiness and combat stability of its troops" and; an improvement in all types of military (intelligence, electronic support and countermeasures, etc) and rear services support. They are totally concealing the true intent of the Japanese high command to prepare the armed forces to conduct modern assault operations on land, sea and in the air.

The foreign press is widely highlighting the issue of broadening Sino-American politico-military cooperation and has concluded that in recent years this has become even closer. As examples of the development of military ties between the two countries are: the conduct of regular consultations with the objective of more effectively actualizing mutual agreements "on security," refinement of plans for the use of armed forces in conformity with the "Basic Principles of Japanese-American Defense Cooperation" of 1978; and assurances of growth of American presence in the western Pacific Ocean.

Consultations between Japan and the United States on the subject of defense policy takes place in the course of regular annual meetings at the level of heads of government, heads of defense ministries and within the framework of security consultative committees (SCC). Accordingly, in January, 1985, during the meetings with President Reagan, Nakasone firmed up plans for military preparations in Asia and the Pacific Ocean basin, where even now a USA-Japan-South Korea military alliance is actively being hammered out. In conformity with understandings reached earlier in 1982, they are now examining the question of mutual undertakings of both countries which they would anticipate executing, in the event of the breakout of military conflict in Asia outside Japan's borders.

The coordinating committee on defense issues and its working groups have accomplished a good deal in strengthening contacts between the Pentagon and the UNO in the course of planning for use of armed force in mutual operations and in examining questions of their effectiveness. In particular, in 1983, there was a full-scale inquiry into the possibility and effectiveness of using joint Japanese-American battle forces as a solution to the problem of the zone of operational responsibility extending out 1,000 miles from the Japanese islands. Joint operations and military preparedness of the staffs and forces of Japan and America in peacetime, in the opinion of Japanese specialists, "improves mutual understandings and interworkings, prepares forces for conducting joint operations in war time, makes an investment in the business of supporting high combat readiness of groups and units, and at the same time intimidates potential enemies."

Judging the military presence of the U.S. in the western Pacific Ocean as an "important factor in assuring the security of Japan," the UNO is calling upon the government to apply to the "security treaty" and the "agreement on status of forces in Japan" greater efforts in guaranteeing Pentagon bases in Japan, to put at the disposal of the American command new territories and firing ranges, equipment and rear security items and to improve as well services to troops stationed there. The UNO actively supports the issue of deployment of two USAF F-16 fighter-bomber squadrons to Misawa Air Base, commencing in 1985.

The UNO leadership, it is noted in the press, is waging a struggle for such cooperation, as a signal to the U.S. to use the latest Japanese technology in its militarist aims. They make the case that, just as the U.S. had helped Japan, after the destruction of World War II, to reestablish its military potential, so now it is Japan's turn to make available to its ally the latest achievements of Japan's science and technology. Following an official exchange of notes on this subject, a joint commission on defense technology was formed, and working groups began to exchange technical information and discussing promising models of weaponry and their application.

On the whole, even the country's bourgeois press affirms the aggressive, revanchist direction undertaken by the Japanese leadership. Practical measures in the area of defense build-up testify to the dangerous tendencies in its militarist course, which foresees playing an active part in the American strategy of global opposition to the Soviet Union and increases the threat to peace and security in the Far East.

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FOREIGN MILITARY AFFAIRS

SOUTH KOREAN ARMED FORCES DISCUSSED, DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 29-34

[Article by Lt Col P. Dorokhov; "The South Korean Army"]

[Text] The U.S. political military leadership, pursuing the Pentagon's military strategy of "direct confrontation" with the Soviet Union, is striving to widen and strengthen its position in many global regions, including the Far East and the Western Pacific. In the course of putting together new aggressive blocs in this region, it assigns an important role to South Korea and its armed forces, equipped and trained with the help of the U.S. The South Korean Army is the principal buttress of the current puppet regime of Chun Doo Hwan, who, unconditionally supporting the aggressive politics of its overseas master, is forcing the militarization of the country and taking measures to build up the combat potential of the armed forces. Year after year, Seoul's military appropriations constitute no less than 6 per cent of its GNP and more than 30 per cent of the national budget.

The military build-up is conducted on a five-year program. At the present time, the third of these (1982-1986) is being realized. The United States is actively participating in its realization having, in 1984, presented its junior partner credit for the purchase of weapons and combat equipment in the amount of 230 million dollars, which, according to the reports in the foreign press, is a 100 per cent increase over corresponding figures for the preceeding year. Within this program, a leading place is assigned to raising the combat potential of the ground forces--the largest and most combat-ready branch of the South Korean armed forces. They are equipped with modern versions of weapons and combat equipment, and their organizational structure and system of command and control have been perfected. According to the foreign press, by 1986, the U.S. plans to present South Korea with the SHERIDAN tank chassis (about 1,000 units), the M88 tracked vehicle retriever (over 20), TOW launchers, STINGER surface-to-air missiles, and artillery-finder radars. In cooperation with American concerns, South Korea has begun production of the HONEST JOHN ballistic missile, M48A5 tanks, 105- and 155-mm howitzers, 130-mm 28- and 36-tube MLRS, TOW anti-tank missiles, 20-mm VULCAN air defense guns, Hughes 500MD fire support helicopters, M109 155-mm self-propelled howitzers, and other armaments.



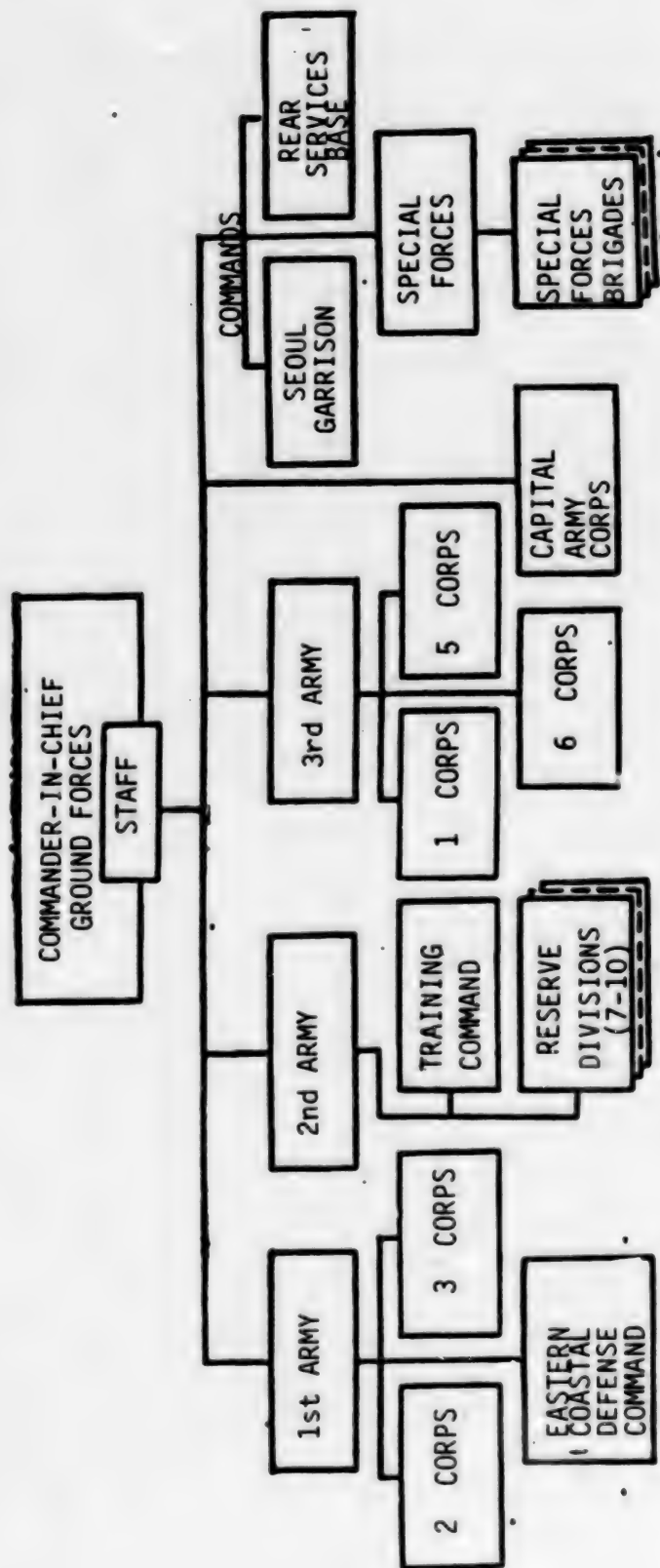


Figure 1. Ground Forces Organization

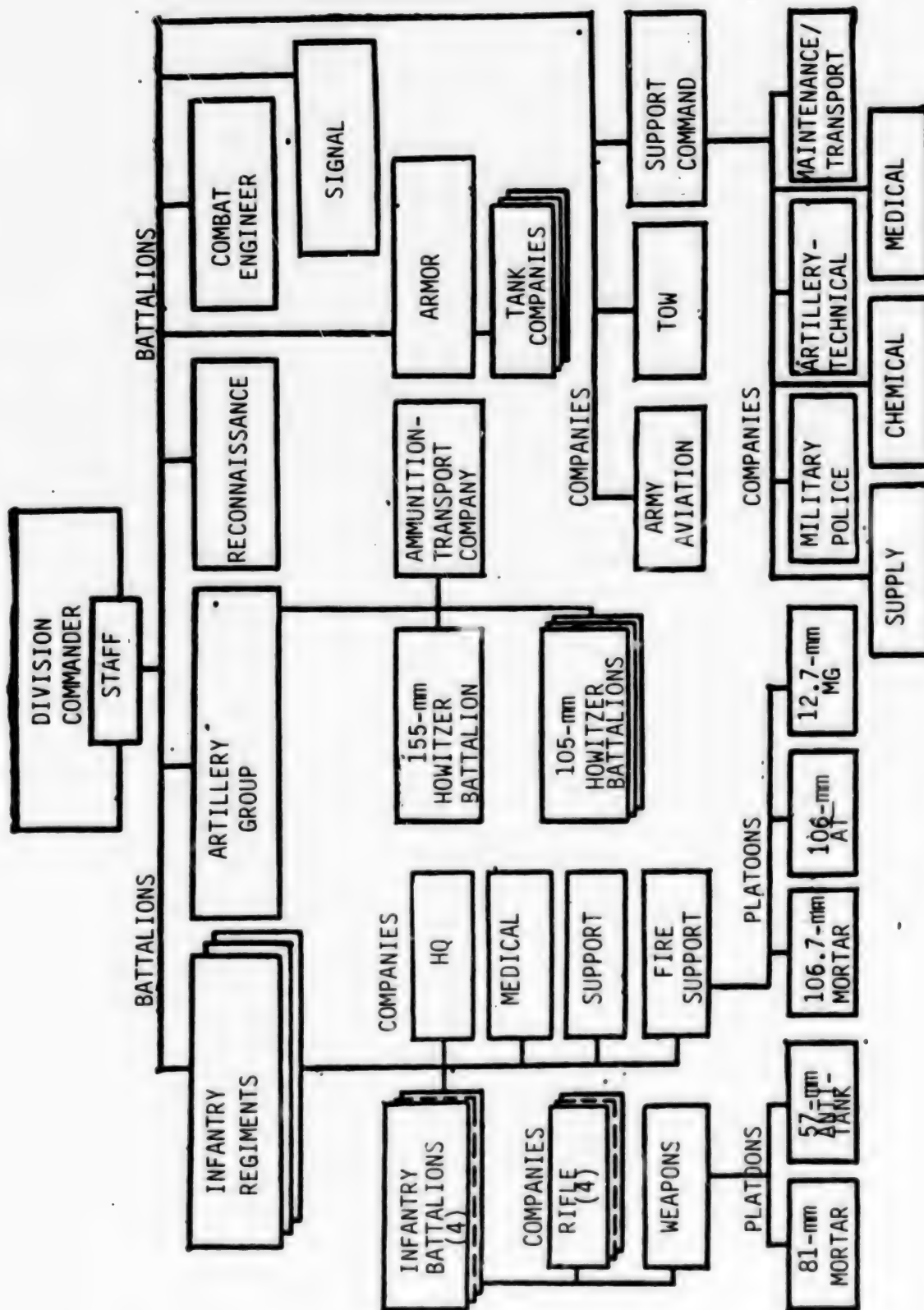
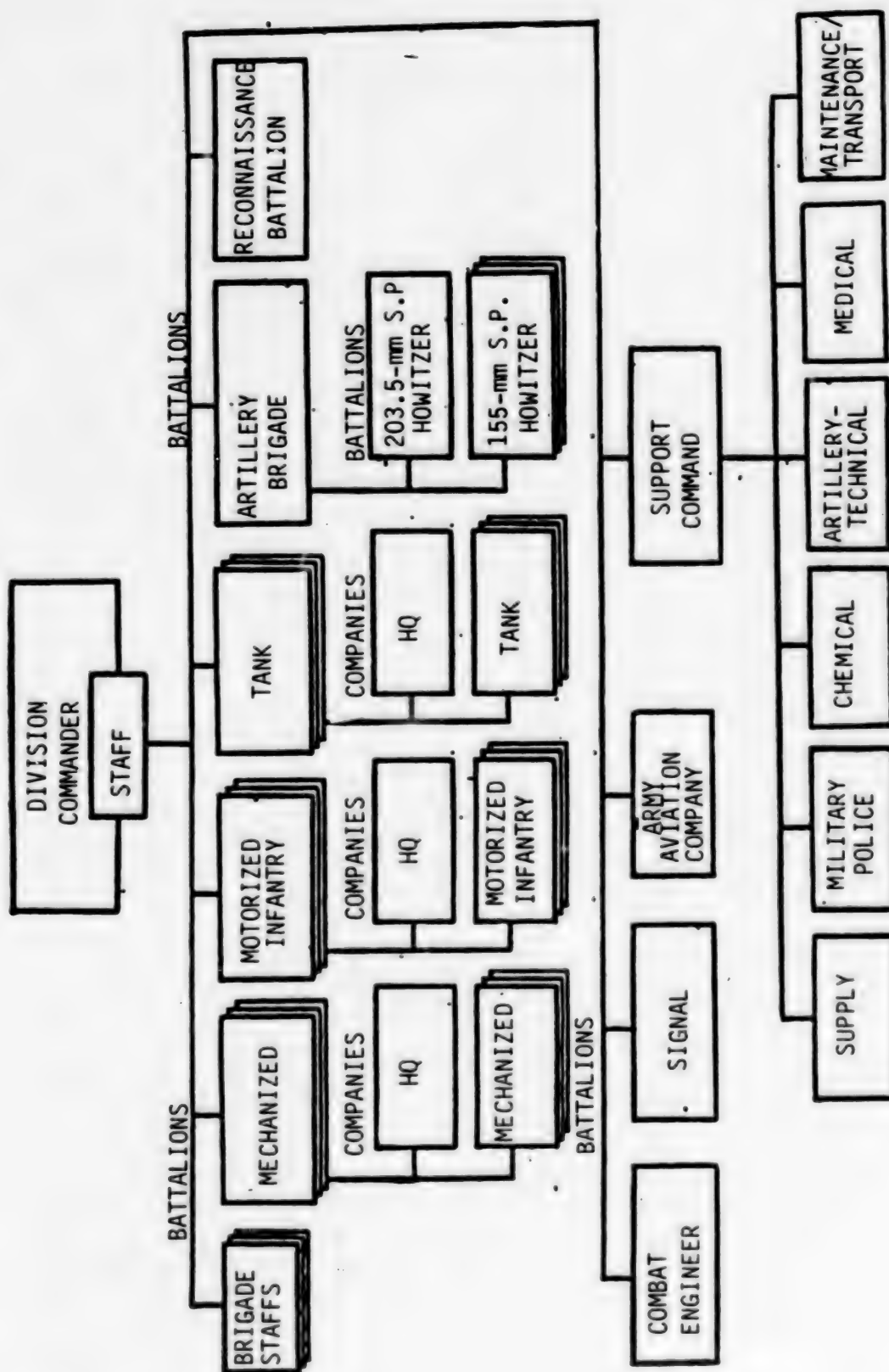


Figure 2. Infantry Division Organization



Administrative control of the ground forces (matters of organization and composition of formations and units, manning and training of cadres, material technical support, etc.) is performed by the Commander-in-Chief (he is actually the Chief of Staff) through the staff, to which three armies are subordinated, the Capital Army Corps and three commands: the Seoul garrison, the special forces, and the Rear Base (Fig. 1).

Operationally, all combat-ready formations and units of the ground forces (with the exception of the Special Forces Brigades) are subordinated to the Combined (American-South Korean) Forces Command, headed by an American general. In fact, the commander of the U.S. armed forces in South Korea exercises complete control over the South Korean armed forces. According to reports in the foreign press, the ground forces number about 540,000 men and comprise infantry, armor, artillery, airborne, engineer and chemical troops, air defense, signal, army aviation, and rear support units and subunits.

There are, within the ground forces component, 20 infantry, 2 mechanized and 7-10 reserve divisions, 2 tank brigades (subordinate to armies), 2 infantry brigades, 7 special forces brigades (airborne), 2 battalions of HONEST JOHN ballistic missiles, 2 air defense artillery brigades, 2 air defense missile brigades (with 2 battalions of NIKE HERCULES and three battalions of HAWKS), a brigade of army aviation, 7 separate tank battalions (subordinate to corps), and 36 separate field artillery battalions.

Corps is the largest tactical organization and does not have a constant composition. Usually it includes 2-4 divisions and corps units and subunits.

The principal tactical organization is the infantry division (with 15,000-18,000 men). It includes a staff, three infantry regiments, an artillery group, four battalions (reconnaissance, tank, combat engineer, signal), two separate companies (army aviation and TOW) and the division support command (Fig. 2). The division includes about 60 tanks (principally obsolete American models), 18 155-mm and 54 105-mm howitzers with mechanized prime movers, about 30 106.7-mm mortars, 18 TOW launchers (mounted on jeep chassis), 18 106-mm recoilless rifles, other weapons and combat materiel.

The mechanized division (about 15,000 men) includes a staff, three brigade staffs, three mechanized, three motorized, and three tank battalions, an artillery brigade, a reconnaissance battalion (with armored carriers), a combat engineer battalion, a signal battalion, a company of army aviation and the division support command (Fig. 3). Its armaments include, typically, 200 tanks, 12 203.2- and 155-mm self-propelled howitzers, about 40 106.7-mm mortars, 18 106-mm recoilless rifles, etc.

According to the foreign press, the ground forces also include (according to several sources), two airborne (airmobile) divisions, which have three parachute (airmobile) regiments of four battalions, three battalions of 105-mm howitzers with mechanized prime movers, four battalions (reconnaissance, transport-assault helicopters, signal, combat engineer), more than 10 groups of army aviation flight controllers, two detachments (quartermaster and military police), and the division support command.



As foreign military specialists note, ground force units and formations are equipped mainly with American weapons and combat equipment, among which are more than 1,000 M47, M48, A5K, M60 tanks (tests of the experimental XK-1 ROKIT are underway, 500 M113 and M577 armored personnel carriers, 350 FIAT 6614 armored carriers, more than 7,500 field artillery pieces and mortars, 12 HONEST JOHN launchers, more than 300 air defense weapons, including 100 NIKE-HERCULES and 120 HAWK), more than 300 airplanes and helicopters in army aviation (50 are fire support helicopters with TOW launchers).

**COMBAT EMPLOYMENT.** Practical exercises in organization and combat take place in the form of command post exercises and training exercises, both combined tactical with American forces and independently, according to mutual plans. Operational and combat training is planned and conducted on the basis of American regulations and directives.

According to JANE'S DEFENSE REVIEW, the South Korean commanders consider their basic method of attack to be attack from positions directly in contact with the enemy. Their principal mission is considered to be the seizure and holding of tactically-important terrain. Forces are organized, as a rule, in two echelons. Battalions and regiments are given missions, reinforcements, boundaries and directions of attack. Divisions are also given directions of the main and supporting attacks. In order to effectively exploit the combat potential of the units and formations together with their attachments, a division (regiment) sometimes forms regimental (battalion) task forces during battle. A regimental combat team may comprise up to four infantry battalions, a tank company, a battalion of 105-mm howitzers, an engineer company and other organizations. A battalion task force may have three rifle companies, a battery of 105-mm howitzers and a tank platoon.

According to the reports in the foreign press, in organizing an attack from positions in direct contact with the enemy, great attention is given to infiltration. This may be accomplished in gaps in the enemy's formation by vertical envelopment. A battalion task force from a division second echelon unit may carry this out. It might include three rifle companies and one recon company, a platoon of 106-mm recoilless rifles, a platoon of 106.7-mm mortars, an engineer platoon, and an army aviation control team. As a rule, two companies of UH-1 helicopters and a company of CH-47 helicopters are provided for the air assault groups. The mission of a tactical air assault includes seizing dominant high ground, road junctions and other key terrain (objectives) and holding them until link-up is made with the main body.

It is noted in the foreign press that the South Korean commanders consider their principal means of defense to be area defense with the goal of holding occupied positions and creating conditions for taking the offensive. In this, an important role belongs to engineering preparation of positions and coordination of fires. The tactical formation is normally two echelons. The first echelon receives the majority of forces and equipment. On the most likely enemy approach, strong points are established which are, as a rule, located on dominate terrain. Ground force commanders do not, however, rule out the possibility of conducting a mobile defense, that, in their opinion, could be limited by the mountainous and difficult terrain, as well as insufficient

track and armored transport in the units and formations, which substantially hamper maneuver of forces.

South Korean military specialists note that during tactical field exercises, attention is devoted mainly to coordination of the actions of infantry units and formations with tanks, tactical and army aviation, crossing water obstacles, as part of an amphibious assault and conducting anti-partisan and reconnaissance-diversionary operations. At the same time, exercise are conducted in combat activities under special conditions (night, in mountains). According to reports in the foreign press, about 70 per cent of tactical training takes place during darkness.

South Korean ground forces formations and units constitute the main element of the contingent which is assembled for the annual American-ROK operational-strategic TEAM SPIRIT exercise. These exercises have taken place on South Korean territory since 1976, and are characterized by the assemblage of a large number of participants and a broad range of missions. According to reports in the foreign press, during the TEAM SPIRIT 85 exercise (February-April, 1985), more than 200,000 servicemen participated (including about 150,000 South Koreans). During the exercise, problems addressed were the transition from conditions of peace to war, reinforcement of American formations in South Korea, and the conduct of combined actions by American and KOK forces under the conditions of armed conflict in that region.

The ranks of the ground forces are filled in accordance with the law on military obligation. The law stipulates that all healthy males, who have reached their 18th birthday, are obligated to serve. The term of obligatory service in the ground forces is 2.5 years. Servicemen who have completed their active service, are transferred to the first-order reserves, which includes personnel up to 40 years of age, and which are reserves for regular army organizations and units and periodically participate in their training. At the initiation of mobilization, they are recalled immediately. Later, they are transferred to the second-order reserves (general reserve), where they remain until they are 50 years old and are subject to call-up during a period of general mobilization. It is reported that there are 1.4 million trained army reservists.

Training of enlisted men takes place in basic training centers and training subunits of units and formations (in the infantry divisions it is in the replacement companies) and follows a variety of programs (over 30, each 2-2.5 months) depending on the branch.

Junior leaders are selected from the best trained soldiers. Future sergeants are trained at training centers and schools for special branches. The courses are up to one year long.

The officer corps is principally comprised of members of the prominent and middle bourgeoisie. Officer personnel undergo training in schools and the army command and staff complex, as well as the National Defense Academy. The term of training in these educational institutions runs from 11 months to 4 years. The highest military education institution is the Defense Academy, where only

generals and senior colonels attend. Some of the officers study in U.S. Army schools.

On the whole, the measures taken by the Seoul regime to increase the combat strength of the army is yet another bit of evidence of the active participation of South Korea for participation in the aggressive actions of American imperialism in the Far East.

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## FOREIGN MILITARY AFFAIRS

### U.S. GROUND FORCES CONVENTIONAL AMMUNITION SUPPLY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 35-37

[Article by Lt Col V. Ferorov; "Supplying U.S. Ground Forces with Conventional Ammunition"]

[Text] Current world events are a convincing witness to the fact that the aggressive nature of imperialism has not changed. As before, it remains a major source of the danger of war. The entire feverishly expanding military might of the capitalist states, military and political blocks, and, first and foremost, their leader, the United States of America, is directed primarily at assuring military superiority over the Soviet Union and the other nations of the Warsaw Treaty Organization. American strategists assert that superiority over the enemy, along with other factors, is achieved by having an advantage in materiel and technical supply and in the organization of the rear services supply of the armed forces in a future war.

According to the views of American specialists, one of the most important tasks in logistics troop support is conventional munitions supply. The regulations of the U.S. ground forces and the open-source military press point out that the course and the outcome of operations, and subsequently, the war as a whole, depend a lot upon the performance of these tasks. Hence, even in peacetime, specific supplies of both conventional as well as special munitions intended to supply the groups of U.S. forces in the conduct of combat activities during the initial period of a war (30 days), have been set aside in theaters of military operations (TVD), especially the European, for the American troops in accordance with existing deployment plans. After that, it is envisioned that the troops will be resupplied with munitions being delivered by basic maritime transport from the continental U.S. to designated ports in the TVD and then to the depots and supply points of the ground forces.

Responsibility for planning and organizing U.S. ground forces supply within the framework of the TVD falls upon the ground forces rear services chief of staff's aide, who works in close cooperation with the MTO (materiel-technical supply) center, which is part of the ground forces' rear services command in the theater. The MTO center constantly receives information on the availability of munitions supplies in depots, their expenditure, and probable



extent of replenishment. Furthermore, the center can directly indent for ammunition through the national inventory and control point for materiel resources located in the continental U.S.

The planning for the ammunition requirements of the troops and for the scope of resupply is accomplished on the basis of norms developed to take into account the conduct of military operations and exercises as well as data on the amount of munitions in depots and with the troops.

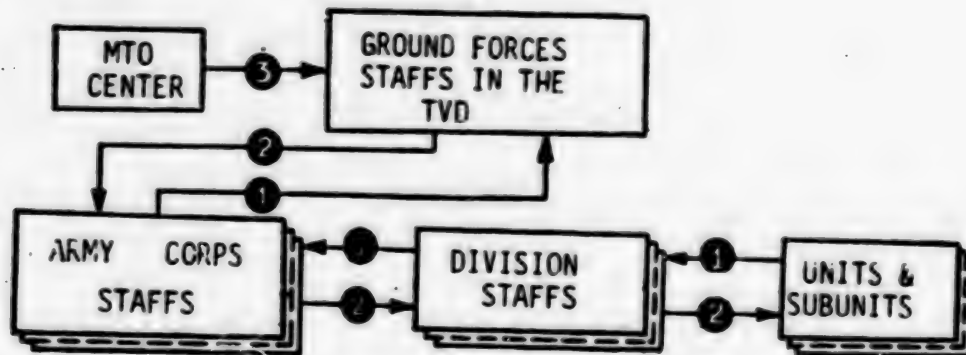
In accordance with American rules and regulations, norms on the expenditure and maintenance of munitions supplies in the TVD have been established that dictate and control munitions supply norms.

The norm for munitions expenditure in the TVD is that quantity of munitions each weapon system expends during one 24-hour period of combat activity. Based on this, and taking into account the anticipated period of military activities (in days), norms are then established for maintaining munitions supplies by weapon system per theater. They are regularly analyzed by specialists, reviewed once a year, and adjusted in the event of the appearance of new perspectives in the conduct of military activities, the introduction of more improved weapons systems and munitions, qualitative and quantitative changes in the armed forces of probable enemies, etc.

The requisite munitions supply norm is that quantity of munitions needed to sustain the combat activities of a formation (unit, subunit) over the course of a specific time period without any restrictions. It is established on the basis of daily munitions expenditure norms for all weapon systems. Information on the requisite supply norm is passed on to the next higher chain of command in the form of generalized requisitions which indicate the necessary number of rounds for each weapon system per diem to conduct military operations in the course of fixed period of time.

The staff of the ground forces in the TVD makes a thorough analysis of the general factors regarding requirements for munitions, compares them to existing supplies, and, depending upon the tasks of the formations and units, establishes controlling supply norms--with the quantity of munitions spelled out in detail (by caliber) that can be allocated to the troops for a fixed period of combat activities, taking into account the extent of supplies in the TVD. These controlling supply norms are calculated in exactly the same units as the requisite supply norms. Controlling norms are approved by the ground forces commander in the TVD for each corps and are passed on to their commanders, who, in turn, set up control norms for the subordinate divisions, detached brigades, etc., right down to the company. The commander is given the right to increase or decrease these norms for the subordinate formations, units, and subunits, depending upon their missions, the amount of munitions which have been issued to him by the next higher chain of command, and available supplies of each kind (caliber) of munitions. In the event some formation, unit, or subunit increases its norms, the commander is obliged to lower the apportionment of munitions to the other units, taking into account that the total expenditure of munitions is not to exceed the controlling norm established for him by the next higher chain of command.

A basic information flow diagram of the requisite and controlling munitions supply norms is presented in the drawing (below).



Flow Diagram for Passing Information Concerning  
Ammunition Supply Norms

1. Required scale of supply. 2. Controlled scale of supply
3. TVD Ground Forces MTO center report of the state of ammunition reserves.

In keeping with the rules and regulations on supplying ground forces with conventional munitions in the theater of military operations, organizations have been established: munitions depots in the TVD (MD TVD), corps munitions depots (CMD), munitions supply points (MSP), and munitions trans-shipment points (MTP).

MUNITIONS DEPOTS IN THE TVD include a network of storehouses which are located within the communications zone and are set up, as a rule, in direct proximity to rail lines, roadways, and water routes. Munitions are delivered to storage sites from unloading ports in the theater and are processed by the forces of the artillery technical group made up of the regional rear services command. It is planned that all munitions intended to be stored in the MD TVD (100 per cent) will be dispatched from U.S. sea transport ports.

CORPS MUNITIONS DEPOTS are deployed in the rear services areas of the army corps calculated at one per first echelon division. They are intended for supplying munitions supply and trans-shipment points with ammunition. They are situated a distance of up to 100 km from the MSPs and up to 130 km from the MTPs. The amount of munition supplies at the corps depots is determined by the chief of the corps rear services and depends upon the availability of storage facilities, the quantity of weapons, the amount of transport resources and the trafficability of roads from the seaports and the zone of communications to the places where the CMDs are located. These supplies are created while the troops are deploying (from 10-12 days), and, during combat activities, can be maintained for 5-7 days. In keeping with the exigencies of the U.S. ground forces, it is allowed to store no more than 25,000 tons of munitions in one place. On the other hand, additional storage areas are set

up in the region where the CMD is located. Of the total amount of ammunition stored in corps warehouses, 50 per cent of it is supposed to be sent from depots in the TVD and the remaining portion directly from the unloading ports.

In order to assure uninterrupted activity in the CMD, the forces and resources of the artillery technical battalion from the personnel of the army corps rear services command are used. It can allocate around 250 men, ten 2.75- and four 1.8-ton trucks, six 20-ton cranes, six 5-ton prime movers with trailers, twelve 1.8-ton and two 2.75 battery-powered warehouse vehicles. The foreign press reports that these personnel and equipment in two-shift operations can process up to 3,700 tons of freight per day.

MUNITIONS SUPPLY POINTS are set up in the rear services areas of divisions a distance of up to 30 km from the munitions trans-shipment points and are calculated at one per brigade. Each MSP has a 3-5 day supply of munitions (approximately 2,000-2,500 tons), which is called the initial supply. From the total inventory, 50 per cent (approximately 1,250 tons) can be sent from corps depots, 30 per cent (about 750 tons) from the ground forces depots in the TVD, and 20 per cent (up to 500 tons) directly from the unloading ports.

The receiving, storage and shipping of munitions is done by the forces and resources of the artillery technical company in the army corps rear services command. In order to assure round-the-clock, two-shift operations, a single munitions supply point may be allocated 215 men, 10 2.75- and 4 1.8-ton trucks, 6 5-ton cranes and 6 5-ton prime movers with trailers. With some reinforcements, a company can actually do the work of two MSPs located a distance of no more than 20 km from one another. The personnel of a single supply point is capable of processing up to 4,000 tons of freight over a 24-hour period, half in shipping and half in receiving. According to calculations by specialists, a mechanized 10-battalion division conducting intense combat activities can expend 3,000 to 6,000 tons of ammunition per day.

MUNITIONS TRANS-LOADING POINTS are set up in the rear services areas of the brigades with one per brigade. They are intended to receive, store and ship out munitions to their subunits. The distance of the MTP from the FEBA is about 10 km. In each such point, from 200 to 250 tons of ammunition, as a rule, are stored on trailers and semi-trailers. They are set up at the orders of the division ammunition supply service chief, who assumes full responsibility for supplying division units and subunits with ammunition.

Ammunition resupply at munitions trans-loading points is planned to get 80 per cent of its required quantity from corps depot and 20 per cent from division munitions supply points using the motor vehicle resources of the rear services commands of the divisions and corps.

The duties of receiving, storing and shipping ammunition from the MTP are performed by a supply and servicing company from the transport and supply battalion subordinate to the division rear services command. To see that these duties are performed, the company commander can allocate 16 men, 1 12.5-ton vehicle, 4 loaders, and 3 5-ton lifting cranes per point. These personnel and equipment are capable of sustaining round-the-clock 2-shift operations in

the MTP and processing up to 550 tons of freight per 24-hour period (50 per cent receiving, 50 per cent shipping.

American specialists are of the opinion that the system of supplying ammunition to the ground forces in the theater of military operations is basically capable of responding to the requirements facing them. However, the foreign press points out that its subunits and structure are inadequate both in personnel and in technology and equipment. In this regard, it has expressed the danger that the organs for ammunition supply may not be able to handle their duties in wartime, especially in the initial period of combat operations.

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## FOREIGN MILITARY AFFAIRS

### WESTERN GROUND FORCES AIR DEFENSES DISCUSSED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 37-44

[Article by Col V. Viktorov; "Capitalist Countries' Ground Forces Air Defense Missile Systems"]

[Text] According to the views of the NATO command, a future war will most likely be characterized by the mass use of air assault resources. Hence, the nations of this aggressive block are attaching a great deal of significance to developing air defense as a way which, to some extent, may be able to lessen the impact of a retaliatory strike. The improvement of air defenses and, in particular, air defense missile (SAM) systems,<sup>1</sup> is being carried out in the capitalist states in the direction of both modernizing types currently in service and developing new systems.

The U.S. has achieved the most success among the NATO countries in creating long- and medium-range SAMs (Table 1). As noted in the foreign press, the newest American SAM, PATRIOT, developed by Raytheon, has started to be put into mass production and issued to the troops. This system will replace the NIKE-HERCULES and some portion of the IMPROVED HAWK. The command leadership of the U.S. Army is planning to purchase a total of 103 firing sections (batteries) of PATRIOT SAMs and 6,200 missiles to go with them. At the present time, the first two divisions (with six batteries each) of this system have already been deployed in the 10th Brigade, 32nd Air Defense Command of the U.S. ground forces, stationed in the FRG. It is intended that by 1992, there will be 54 such batteries in central Europe. A number of partner nations in the aggressive NATO block (FRG, Belgium, Italy, the Netherlands, and others), as well as Japan have shown interest in the new American SAM.

American specialists emphasize that an important advantage of the PATRIOT over the IMPROVED HAWK and NIKE-HERCULES, currently in service, lies in the ability to fire it simultaneously at eight air targets flying at different altitudes under strong ECM conditions. The combat capabilities of the system have been increased by taking new technical approaches, in particular, radar with a phased array antenna and high-speed computer technology, which allow one to complete much more quickly all the necessary operations on a large flow of data. According to an evaluation by foreign specialists, the PATRIOT exceeds existing foreign long- and medium-range systems by a factor of four in the

Table 1. AMERICAN LONG- AND MEDIUM-RANGE AIR DEFENSE BATTERIES			
Designation (Country of Development year of service entry)	NIKE-HERCULES (U.S. 1958)	PATRIOT (U.S. 1984)	Improved HAWK U.S. 1973
Battery Characteristics			
Maximum range of Interception, km	140	60	40
Maximum Altitude of Interception, km	45	24	18
Minimum Altitude of Interception, km	3	--	0.03
Missile Characteristics			
Launch wgt, kg	4800	1000	625
Length, m	12.6	5.3	5
Body diameter, m	0.8	0.41	0.37
Wing span, m	2.66	0.87	1.22
Maximum speed, m/s	940	1700	900
Control System	Radio Command	Mid-course, radio command; Terminal, semi- active radar	Semi-active radar

area of firepower. Its resistance to jamming is also considered ten times better and it is twice as effective in inflicting damage on maneuvering targets. The use of a built-in device to control the system's parameters allows this system to be employed by less-trained operators.

The PATRIOT contains a multi-purpose AN/MPQ-53 radar, an AN/MSQ-104 command post, an M-109 launcher with four MIM-104 SAMs, four gas turbine power sources (60 kW each), a communications device, and auxiliary operations equipment.

The multi-purpose AN/MPQ-53 radar is capable of search, detection, lock-on, recognition and tracking air targets, illuminating them, and transmitting guidance signals to the SAMs. The radar is mounted on an M818 semi-trailer. The radar is capable of detecting air targets at a range of up to 150 km. It operates on the 1-cm waveband (4-6 GHz) on 160 discrete frequencies. The azimuth scanning angle is 110-120 degrees and the angle of sight is 90 degrees. Radar guidance of the missile is achieved using a combined approach: radio commands are issued during the mid-portion of the trajectory and a so-called TVM, (Track--via Missile) during the final portion, whereby the station uses data from the homing head of the rocket during the guidance process.

The AN/MSQ-104 command post (its crew consists of two operators) processes information received from the radar that is necessary for managing the system's combat operation. It is fitted out in a standard van body mounted on the chassis of an M814 truck. Each operator's work station contains: a display unit covering the air situation, a keyboard for inputting information into the computer, a panel to check the working order of the system components, and a joystick for the display unit.

Along one wall of the van is the system's communications device and the operator's work station, and the computer, a terminal for transmitting data, a link-up device with the radar and the launchers, and the station for the second operator as well as auxiliary equipment are along the other wall.

The computer, which was especially developed for this SAM, is a parallel-action 24-bit computing device capable of performing both fixed and floating point operating. It has an operating speed of 1 million operations per second and a memory capacity of 410 million bits.

The MIM-104 SAM (5.3 meters long, 0.41 meters in diameter, and weighing about 1,000 kg) is one of the wingless varieties with a solid fuel engine. It is equipped with a warhead that weighs 75 kg. The missile is delivered from the manufacturer fully ready for launching and fits in a container with a rectangular profile that is used both to store as well as facilitate the launching of the missile. The missile is held inside the container on guide rails. The container (loaded weight, 1,696 kg) has aluminum sheathing on it and is mounted onto the frame of the launcher.

The M-901 launcher, which can hold four containers, is mounted on an M860 semi-trailer, which is pulled by a wheeled M818 prime mover. The launcher can be rotated in any direction. The optimal number of launchers which can be put into any system is considered to be five, but it can vary from three to eight, depending upon how the air defenses are structured.

The most common medium SAM in service among the ground forces of the capitalist countries is the American IMPROVED HAWK system, which was developed in the early 1970s, and based on the HAWK. In contrast to the initial variant, it employs a SAM with a more powerful warhead, an improved auto-guidance device, and an improved engine. A computer has also been introduced which allows one to increase the level of automation in guided fire processing, in particular, in automatically analyzing the make-up of the air target and the automatic launching of the SAM, should a low-flying target suddenly appear. In order to increase its resistance to jamming, the system has modernized radar detection assets.

An IMPROVED HAWK SAM battery usually consists of two fire sections and has one pulse radar for detecting targets at high and medium altitudes, one pulse Doppler-effect radar for detecting targets at low altitudes, a launcher firecontrol unit, three transport-loading vehicles and other technical assets. All the SAM elements are mounted in a single-axle semitrailer and two-axle vans. The launcher can hold three missiles. The training drive is electrical and the pointing drive is hydraulic.

In the opinion of American specialists, the IMPROVED HAWK has rather high mobility but is nevertheless inadequate for use on the FEBA to conduct an assault or use on the defense. In response to this, the U.S. has developed a self-propelled variant of the SAM on the chassis of a tracked M727 transporter. The fire subunit consists of three vehicles with one launcher on each vehicle with three guide rails per launcher. The transporters also haul a radar to detect low-flying targets, one illumination radar, a command post and auxiliary equipment.

Presently, in order to increase the capabilities of the IMPROVED HAWK system to destroy air targets, an electronic optical target tracking system called TAS (Tracking Adjunct System) has been added to the system's equipment components. Also, development is underway on a three-coordinate radar with phased array antenna. This radar will most likely replace practically all the radar assets now used by the IMPROVED HAWK.

Over the last decade, the capitalist nations have paid a great deal of attention to creating and producing MOBILE SHORT-RANGE SAMs (Table 2). This has come about, in part, because the tactical combat effects of air attack assets have undergone substantive changes. Aircraft are capable of flying at low and extremely low altitudes, at high speeds, using ECM. This has led to a sharp reduction in the detection range for air targets and in the data processing time preparatory to opening fire.

Foreign specialists have formulated the basic tactical and technical requirements for short-range SAM. Such air defense missile systems ought to be able to inflict damage upon air targets flying at speeds up to 700 meters per second, having an effective area of dispersion from 0.1 square meters or more at altitudes of 15 to 6,000 meters and at ranges of 7 to 10 km. The system should be able to remain in constant readiness to evaluate the air situation and to detect air targets even while the system is in motion. It should have a short reaction time and a high probability of damaging targets under variant day and nighttime visibility conditions. Furthermore, each SAM ought to have an IFF unit, a large number of ready-to-launch missiles, and automatic reload capability, adequate mobility and air transportability, low cost, and relatively easy serviceability. In the opinion of foreign experts, systems which sufficiently meet these requirements include: ROLAND (FRG, France), CROTALE (France), RAPIER (Great Britain), SPADA (Italy), SKYGUARD-SPARROW and ADATS (Switzerland), and 81 (Japan, previously designated TAN-SAM).

In order to detect low flying targets on a timely basis and assure autonomy in operations, the systems use compact anti-jamming pulse Doppler-effect radar, as a rule, with mechanical beam scanning. The station is equipped with display units with a 360 degree range of vision that display the air situation for a radius of 15-18 km. They are mounted either together with the launcher (ROLAND, RAPIER) or on a separate vehicle or trailer (81, CROTALE, SPADA).



Table 2. SHORT-RANGE AIR DEFENSE MISSILE BATTERIES

Designation, Country of Development	SPADA Italy	SKYGUARD- SPARROW Swiss	SHAIN France	81 Japan	CROTAL France	ADATS Swiss	ROLAND FRG France	RAPIER U.K.	CHAPARRAL U.S.
Battery Characteristics									
Maximum Range of Interception, km	15	10	10	10	8.3	8	6.2	5	4
Minimum Range of Interception, km	—	1.5	0.5	—	0.5	1.0	0.26	0.5	0.8
Maximum Altitude of Interception, km	6	6	3	—	3	5	5.5	3.6	2.5
Minimum Altitude of Interception	0.015	0.015	0.05	—	0.05	—	0.015	0.03	0.15
Reaction Time, s	20	6-8	6	8	6	—	6-8	7	10
Maximum Target Speed, m/s	—	400	410	—	410	—	450	360	270
Missile Characteristics									
Launch Wgt, kg	220	205	105	100	80	51	62.5	43.5	84
Length, m	3.7	3.6	3.12	2.7	2.94	2	2.4	2.24	2.9
Body Diameter, m	0.2	0.2	0.15	0.16		0.152	0.16	0.13	0.127
Wing Span, m	0.8	1	0.54	0.58		—	0.5	0.38	0.64
Maximum Speed, m/s	700	700	850	700	800	900	580	650	850
Type Warhead	frag-HE	frag-HE	frag-HE	frag-HE	frag-HE	frag-HE + hollow charge	frag-HE	semi- armor piercing	frag-HE
Warhead Wgt, kg	33	30	15	—	15	12	6.5	—	5
Control System	semi- active radar	semi- active radar	radar	passive IR and inertial	radio command + laser beam	radio command + laser beam	radio command	radio command	passive IR

The radar for the Japanese 81 SAM uses a phased array antenna which assures synchronous lock-on and rough tracking of up to six air targets. Based on the data received at the station, the system's computer determines the level of threat of each target. After selecting the most dangerous targets, the radar switches over to a precise tracking mode. The range of the station's operation is 30 km.

An important feature of the short range SAM is its use of all-weather guidance systems. The foreign press has expressed differing points of view concerning the utility of using them. It was noted in particular, that planes cannot fly at low altitudes in fog and during low cloud cover and that targets can be attacked at low altitudes only during periods of good visibility. Such a perception lends itself to optical guidance and control systems for SAMs. However, modern aircraft's navigation and pilot systems allow planes to perform combat missions at low and extremely low altitudes in any kind of weather by day or night. This situation certainly favors having an all-weather capability in deploying short-range SAMs. The CROTALE, SPADA, and SKYGUARD-SPARROW employ all-weather systems, but the ROLAND has both variants (the ROLAND-1 for the French ground forces has clear-weather, and the ROLAND-2 for the FRG ground forces has all-weather). The RAPIER was created as a clear-weather system, but has subsequently incorporated a BLINDFIRE radar into it to track air targets and to guide the SAM.

The firecontrol radar system, as a rule, has one receiver and three tracking channels (one for the target and two for the missile). A transponder is mounted on board the SAM; it is used for tracking the missile. The narrow beam width and the short pulse duration used on target tracking and missile guidance radar allow one to obtain a rather precise image of the target and the missile on the display unit screen. During the initial phase of the trajectory, automatic infrared devices are used to guide the missile into the line of sight of the target. It is believed that increasing the number of radars in a SAM system results in the system becoming more vulnerable to radioelectronic warfare. This is why new methods of guiding SAMs, for example, with laser beams (the Swiss ADATS SAM) have been examined abroad in the creation of short-range SAMs that can assure protection against ECM.

The foreign press has noted that operability of SAMs under conditions where radioelectronic warfare is being conducted by the enemy can be assured by simultaneously using anti-jamming radar and optical assets for tracking targets. Hence, the ROLAND, CROTALE, SPADA and SKYGUARD-SPARROW (and recently the IMPROVED HAWK), have been equipped with radar and optical systems for tracking air targets. The device for these systems allows the operator to use one or the other tracking system, depending on the tactical situation. For example, in the CROTALE, the shift from guidance system to the other can be accomplished even while the missile is being guided.

The ground forces of many of the capitalist states have in service the American short range CHAPARRAL, where the missile is aimed at the target by means of a passive infrared homing device. In order to increase the effectiveness of using this system to fire at low-flying targets, it has undergone modernization in recent years.

The improved CHAPARRAL has a modern optical device to detect air targets and control the launching of the missiles. The SAM has a heat-sensing device mounted in it, which allows one to fire it at night and under conditions of restricted visibility. The improved MIM-72C missile uses an infrared homing device that automatically separates out background interference from the target and assures firing into the forward hemisphere. Furthermore, the missile has a smokeless solid-fuel engine mounted in it, thereby concealing when the the rocket was launched and making the observation of it in flight difficult. It also has an improved non-contact proximity fuse and a more powerful fragmentation HE warhead.

One of the basic requirements in the development of short-range systems is giving them necessary mobility. This requirement has been met by using a self-propelled chassis which has good cross-country performance. Hence, the ROLAND system is mounted on the tracked chassis of the AMX-30 tank (France) and the MARDER armored personnel carrier (FRG); on the wheeled chassis of the M812A2 vehicle (USA) and the BERLIET (Belgium). The self-propelled variant of the RAPIER system developed for the ground forces of Great Britain is mounted on the American M548 tracked transporter. The CROTALE, however, was put on an armored vehicle chassis.

An important feature of a short-range SAM, to assure that troops are covered on the march and in the field, is considered to be its ability to fire while the vehicle is in motion. In order to do this, foreign developers are trying out new design solutions. Hence, the chassis of the armored vehicle of the French firm of Hotchkiss-Brant on which the CROTALE system is mounted has a soft engine suspension, an electric transmission, a hydropneumatic wheel suspension, etc. As a result, the vehicle is able to avoid vibrational noises which affect the operation of the detection radar and assure its operability even when in motion. In creating the ROLAND SAM, a system of radar and launcher stabilization was introduced into its design. However, missile launching at short range is still only done while stopped.

In order to increase the firepower of short-range SAMs, launchers with several guide rails and automatic reloading are used. For example, the ROLAND-2 has two missiles on rails and eight missiles in two revolver-type magazines (reloading takes about ten seconds).

The foreign press notes that at the present time the process of perfecting a short range air defense missile systems is underway. French specialists have created the SHAIN system based on the CROTALE SAMs. It is now being put into place in Saudi Arabia. In this system, the radar for detecting air targets, the launchers, target tracking and SAM guidance radars, are mounted on a tracked AMX-30 tank chassis. One detection radar will control three to four launchers. It has higher resolution and the antenna's beam width has been reduced from 3.5 to 1.4 degrees. The station is equipped with a device to automatically determine the position of the launchers and bring them into parallax, thereby allowing one to open fire as soon as the selected launcher has ceased moving. The launcher has 6 guide rails instead of four. The maximum range of fire of the system has been increased to 10 km as a result of the missile using a new, more powerful engine.



Various modifications have also been made based on the Franco-West German ROLAND-2. The U.S. has developed its own variant of this system. It makes use of new verification and communications equipment, and the analog computer has been replaced with a digital one. At the request of the Belgian Ministry of Defense, French specialists have created a modified variant, the ROLAND-2C, which is intended primarily to protect stationary targets. In contrast to the basic variant, where all the equipment is deployed on a single tracked chassis, the new complex consists of a command post and a launcher located on the chassis of a BERLIET vehicle with good cross-country performance. The target detection radar uses a French anti-jamming pulse Doppler-effect radar like the one used on the CROTALE.

The modernization of the English RAPIER SAM is continuing. The towed variant, which does not have BLINDFIRE radar, will be outfitted with a composite (with an IR imager) target tracking device. To do this, a standard optical device has been reoutfitted in such a way that the gunners's sight also has a thermal imagery capability built into it.

The system's guidance mechanism will be rebuilt from an analog to a digital format (with distributed microprocessors and high speed information and guidance multiplexing channels). English specialists are of the opinion that the addition of the infrared target tracking channel as well as the developed heat sensor for air surveillance, or PASS (Passive Aircraft Surveillance System), coupled with a laser range finder and built-in distributed microprocessors and multiplexing system, will turn the towed RAPIER into a fully automated complex.

The self-propelled RAPIER will be outfitted with a new device to detect and track targets in the form of an HPS (Helmet Pointing System) commander's helmet sight and a heat-seeking channel in the pointer's optical sight. In the course of the system's further modernization, various improvements will also be introduced that have already been build into the towed variant.

In the early 1980s, the English firm of British Aerospace, under contract with the Ministry of Defense, created a new SAM variant, conventionally termed the LASERFIRE RAPIER.<sup>2</sup> It differs from the existing system by having a laser device which automatically tracks targets detected by radar. The first firing tests of the LASERFIRE RAPIER were conducted at the end of 1984. The delivery of this system to the forces is possible starting after 1986.

In developing all types of SAMs, foreign specialists consider a high level of component and system reliability, minimized checking during use, and ease in servicing and repair to be the primary ways in which to assure necessary combat reliability. To do this, SAMs such as the PATRIOT, CROTALE, ROLAND, and RAPIER have built-in automatic control devices, and their basic components consist of a series of blocks (modules), which, in the event they should fail, can be replaced easily under field conditions. An approach such as this also allows one to decrease the total number of supply parts needed to service the systems. For example, the number of supply parts needed for the NIKE-HERCULES is about 13,000 units, whereas the PATRIOT system requires less than 2,000. As a result, the costs associated with deployment outlays is decreased by a factor of three. Furthermore, the high level of automation in the new SAMs



has led to a reduction in the number of servicing personnel. Thus, a PATRIOT battalion number 765 men whereas a NIKE-HERCULES battalion requires more than 1,000.

The technical servicing of the above systems, as a rule, is done at several levels, the volume and complexity of which increase as a function of the increase in the amount of time it takes to service the SAM.

1. This article describes foreign short- medium- and long-range SAMs. See Zarubezhnoye voyennoye obozreniye, No. 7, 1982, pp. 33-38 concerning portable SAMs.

2. For more details on the new variant of the RAPIER SAM, see: FOREIGN MILITARY REVIEW, 1984, No. 22, pp. 43-44.

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FOREIGN MILITARY AFFAIRS

U.S. AIR FORCES PACIFIC COMMAND DISCUSSED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 45-51

[Article by Col V. Grebeshkovskiy; "The U.S. Air Force Command in the Pacific"]

[Text] The U.S. Air Force command in the Pacific Ocean region [PACAF] (headquartered at Hickam Air Force Base, Hawaii) is one of the main commands of the American Air Force and is also the air force component of the U.S. Armed Forces Unified Command in this area.

Created for carrying out an aggressive U.S. policy in the Far East and Southeast Asia, this command is intended for conducting combat operations in the given region in all types of wars and conflicts, both independently and in cooperation with the U.S. ground forces and navy, and even with the armed forces of U.S. allies. In addition, it is assigned the mission of participating in the suppression of national-liberation movements and helping the air forces of other countries in the region. These missions are carried out on the basis of bilateral agreements and defense treaties with Japan, South Korea, the Philippines and Thailand, and even within the boundaries of the military bloc ANZUS, which includes the USA, Australia and New Zealand.

On the whole, the Pentagon considers the Asian-Pacific region as a second-in-importance arena of military-political confrontation with the USSR. Utilizing this territory, it plans to position first strike weapons as near as possible to the Soviet borders.

A second-in-importance (after the U.S. Air Force Command in Europe) tactical aviation grouping, numbering about 39,000 personnel (27,000 military and 12,000 civilians) and more than 400 combat aircraft and auxiliary aviation), is deployed within the boundaries of the U.S. Air Force Command in the region. A main portion of the tactical fighters are capable of carrying nuclear weapons.

The activities of this aviation grouping, as underscored in the foreign press, is supported by other U.S. Air Force commands which deploy their formations, units and subunits there, numbering approximately 15,000 personnel.

For example, the Strategic Air Command, in the interests of PACAF, assigns KC-135 tankers from the 3rd Independent Air Division (Andersen AFB, Guam) to support aerial refueling of tactical aviation flying from the continental USA or completing operational or combat training flights, and even bombers for conducting aerial reconnaissance and delivering strikes on ground and naval targets. To execute these missions, the 376th Air Wing is deployed to Kadena AFB, Japan, and the 43rd Heavy Bomber Wing, equipped with B-52's, is deployed to Andersen AFB.

If necessary, the latter can be employed for conventional operations in the interest of PACAF. Subunits of strategic reconnaissance aviation (RC-135, SR-71, and U-2) are also based in the Pacific Ocean region at air bases in South Korea and Japan.

Military Airlift Command (MAC) cooperates with PACAF through the headquarters of the 834th Airlift Division (Hickam AFB, Hawaii), assigning it the necessary number of military-transport aircraft C-5, C-141 and C-130, and also organizing weather support for the activities of tactical aviation in the region, and search and rescue operations. For aerial transport of troops and cargo in the TVD, the division includes the 374th Tactical Transport Wing (Clark AFB, Philippines), equipped with C-130 aircraft. Other aircraft (C-5 and C-141) of MAC arrive from airbases located on the territory of the USA.

The U.S. Air Force Communications Command has the necessary number of radio-technical navigation systems and subunits of all types of communication in the region.

The Electronic Security Command at Osan AB (South Korea), Misawa AB (Japan), Clark AB (Philippines) and Wheeler AFB (Hawaii) maintains radio and radio-technical reconnaissance units. Its forces and equipment monitor the reliability of systems for secret troop command-and-control, conduct reconnaissance and organize electronic countermeasures.

The Tactical Air Command (TAC) organizes crew training and the retraining of personnel of air subunits on new equipment, including this grouping. If necessary, personnel and equipment for reinforcing tactical aviation in the region are assigned from it. In 1979, TAC deployed a detachment of E-3A Airborne Warning and Control aircraft to Kadena AB on a regular basis according to the "rotation" principle. Aircraft of the detachment regularly complete combat air patrol flights, particularly along the USSR borders, actively interact with Japanese and South Korean air defense systems and participate in almost all exercises conducted by the American command in the region, both independently and jointly with the armed forces of allied countries.

As is underscored in the foreign press, counting the units and subunits of all the Air Force commands in the Air Forces Pacific Ocean grouping, there are approximately 54,000 personnel and around 500 aircraft of various types. The main part of this grouping is located in South Korea and Japan, that is, within close proximity to the Soviet Far East. The remaining units and subunits are regularly based on the Philippines, Hawaii and the Marquesas Islands. If necessary, it may be substantially reinforced by air force units,

redeployed from the continental USA. Official American sources note that during the war in Southeast Asia in the 1970's, there were around 350 bombers, 1,700 tactical aircraft and almost 175,000 personnel in the U.S. Air Force Command in the Pacific region.

By the end of the 70s, after the conclusion of the war, approximately 50,000 men and 300 aircraft, including 200 F-4C tactical fighters, remained there.

However, as reported in the American press, beginning in 1979, in connection with the sharp increase in attention to the region, connected with the growth of its economic and military-political importance, the Air Forces grouping in the Pacific region underwent a substantial reorganization. A detachment of E-3 Airborne Warning and Control aircraft, substantially improving the combat potential of the tactical aviation grouping, was deployed to Kadena AB. New generation F-15 and F-16 tactical fighters and the specialized F-16 "Wild Weasel" aircraft for combat with PVO systems began to enter the armament of units and subunits of this command, replacing aging types of aircraft, and new air force subunits were established. For example, a squadron of A-10 ground-attack aircraft was formed at Suwon AB (South Korea) in 1982. At Misawa AB, Japan, the 432nd Tactical Fighter Wing, equipped with the light multipurpose F-16 tactical fighter, capable of delivering nuclear weapons, is in the initial stage of formulation. In all, the wing should have two squadrons (almost 50 aircraft) by 1987.

Much attention is paid to the development of combat support systems. Based in South Korea, a target designation squadron was equipped with the new OA-37 aircraft, and its existing OV-10 were transferred to the same type of squadron at Hickam AFB, Hawaii, to replace the aging O-2 aircraft there.

Simultaneously, with the reinforcement of the American air force grouping, the infrastructure of the region is being perfected. In 1979, 22 million dollars was allocated for this in the military budget, and in 1982 the Pentagon's expenditure for this increased almost ten fold to 218.2 million dollars (besides this, Japan, South Korea and other countries are contributing a substantial amount). A main portion of the expenditures go toward the construction of new and the improvement of existing runways at airfields utilized by the U.S. Air Force and the creation of shelters at them for aircraft, POL and other objects. In particular, hardened shelters measuring 44 x 18 meters are being constructed at Osan and Suson which are equipped with 60-ton doors. Each of these can hold three F-4, F-15, A-10 aircraft or one U-2 strategic reconnaissance aircraft. Pass-through shelters adapted for rapid refueling of aircraft and suspension of ammunition for turn-around sorties were also erected there. Similar work is being carried out at Kunsan. A great deal of work is being completed at Kadena and Yokota Air Bases (Japan) and Clark AB (Philippines). As is underscored in the foreign press, the work for improving the infrastructure is being conducted at all 11 main air bases assigned to the U.S. by allied countries.

At present, according to the information of the foreign press, PACAF includes two (5th and 13th) air forces, one (326th) independent air division and independent subunits directly subordinated to PACAF's staff.



The 5th Air Force (headquartered at Yokota AB, Japan) has two (313th and 314th) air divisions, the headquarters of which are command organs for units of U.S. tactical aviation, and are based in Japan and South Korea respectively.

The 313th Air Division (Kadena AB) has one (18th) tactical fighter wing (three squadrons of F-15 fighters and one squadron of RF-4C reconnaissance aircraft), and also several supplementary aircraft and helicopters. The division, apart from Kadena AB, has at its disposal Yokota and Misawa, which support the 475th and 6112 Air Base Wing respectively. Communication aircraft and helicopters (T-39 and UH-1) are regularly based at the former.

Subunits of the U.S. Air Force in Japan play an important role in the overall system of American-Japanese military collaboration. They participate in the country's PVO system along with the National Air Force of Japan, conducting aerial refueling at distances up to 1,800 km from the main islands. In addition, according to the statements of American generals, the USAF aircraft deployed there provide an offensive capability, that is, the capability to deliver strikes against ground and surface targets, to the American-Japanese grouping. According to the calculations of foreign experts, the deployment of new aircraft to Misawa AB, located 600 km from Sakhalin Island and 800 km from Vladivostok, allows the USA to target the USSR's entire far eastern territory.

The 314th Air Division (Osan AB, South Korea) has two (8th and 51st) tactical fighter wings and one (5th) tactical control group. The 8th Tactical Fighter Wing includes two squadrons of F-16 (48 aircraft at Kunsan AB), and the 51st Tactical Fighter Wing has two squadrons of F-4E tactical fighters (Osan and Targu), and also a squadron of A-10 ground-attack aircraft (Suwon). In the 5th Tactical Control Group there is a squadron of OA-37 aircraft (Osan). Besides the places of the regular distribution of the division's units and subunits, it has at its disposal Kwang Ju AB, at which the 6171st Air Base Squadron is deployed.

Approximately half of PACAF's tactical aviation fleet is located in South Korea. According to the views of the Pentagon's leadership, these forces are intended to participate first in a so-called future Korean conflict. Under the false thesis of "the threat from the North," the American propaganda machine is directing all its efforts toward the justification of U.S. military activities in this country.

The U.S. Air Force in South Korea cooperates closely with the national air force, participating in the country's air defense, utilizing their airfields and firing ranges. Several subunits of the American Air Force are serviced by South Korean specialists. Commanders of the U.S. and South Korean troop contingents exercise control of air forces from one and the same command point (Osan AB).

The 13th Air Force (Clark, Philippines) has in peacetime one (3rd) tactical fighter wing, which includes two squadrons equipped with F-4E and F-46 WILD WEASEL aircraft intended for combat with enemy PVO systems by means of their reconnaissance and rapid delivery of strikes by the SHRIKE and STANDARD-ARM

anti-radiation missiles. The wing includes one "Aggressor" combat-training squadron, equipped with F-5 and T-39 aircraft.

The independent 326th Air Division (Wheeler AFB, Hawaii) is intended for fulfillment of a PVO mission, although its order of battle is not available. It controls on-duty fighters assigned from a squadron of the national guard based there, equipped with F-4C aircraft and also forces of tactical aviation of TAC and the Alaskan Air Command, which periodically arrives there for participation in various exercises.

At Hickam AFB, where the headquarters of PACAF is located, there is the 15th Air Base Wing, which supports the base's operations, its functioning, and also a squadron of airborne command posts - EC-135 for supporting aerial refueling.

The units and subunits of the command are completely staffed and equipped with aviation systems. Their crews regularly perfect pilot skills, which the peculiarities of the theater demand. For this, the main attention is directed toward developing tactical methods under conditions approaching, as nearly as possible, those of combat. According to the reports of the foreign press, each year units of PACAF complete more than 11,000 sorties and participate in more than 60 various types of exercises, 90 percent of which are conducted in cooperation with other branches of the U.S. armed services, and 70 per cent jointly with the armed services of the allied countries.

One of the largest of these is the joint American-South Korean exercise "Team Spirit," in which up to 200,000 personnel and more than 500 combat aircraft usually participate. During this exercise, the U.S. Air Force grouping in South Korea is reinforced by transferring subunits of American F-16 tactical fighters, F-15's and others from units in the continental U.S. and airbases in the region. During the exercise, the Air Force works out the entire complex of its combat missions, paying primary attention to questions concerning command-and-control (AWACS) aircraft in conditions where the enemy employs radio-electronic countermeasures, and various air force arms interact to achieve air superiority, direct air support and interdict of combat operations.

In the course of these exercises, the main efforts of the Air Force are directed towards the organization of close cooperation between American and South Korean air forces. With these goals, the U.S. and South Korean commanders work in turn at the tactical aviation command-and-control centers and posts, widely utilizing the E-3A Airborne Warning and Control aircraft, and even forward air controllers on OA-37 aircraft. Frequently, the U.S. and South Korean aircraft fly in a single combat formation for the delivery of strikes on ground targets, etc.

Similar questions are also worked out during multipurpose, joint American-Japanese exercises ("Cope-North" and others). The central theme in these exercises is the repulsion of the "threat from the North" which gives them an openly anti-Soviet character).

The multipurpose exercises "RIMPAC," conducted since 1971, in the eastern part of the Pacific, play a main role in the working out of cooperation. Mainly

the navies of the U.S., Japan, Australia and New Zealand participate in them. However, the U.S. Air Force assigns a significant number of tactical air units, arriving from the continental U.S. to Hawaii, and also E-3A aircraft and tankers to participate in them. The latest of such exercises, "RIMPAC-84," surpassed in scale all the previous ones in this series. Around 80 vessels and 250 combat aircraft participated in it.

In order to support a high combat readiness level of air force units, American military leaders periodically organize instructional inspections and special complex training. As for example, during one of the inspections to determine the readiness of the Air Force to disperse within the TVD and conduct operations from other bases, the aircraft of the command completed more than 1,200 sorties over a period of four days. It was noted in the Western press that recently the Pentagon conducted such an inspection to determine the capabilities to reinforce the U.S. Air Force grouping on South Korea by so-called internal reserves, that is, from within the command. During the inspection, approximately 250 combat and auxiliary aircraft were transferred to air bases in South Korea from airbases in Japan, the Philippines and Hawaii.

The main measures for preparing crews to conduct operations under conditions closely approximating those of combat are the air force exercises "Cope Thunder," which are regularly (approximately 8 times a year) conducted at Clark AB (Philippines). Subunits of all PACAF's wings, aircraft of the navy and marine corps, such as the A-4 SKY HAWK arrive for them. In addition, aviation subunits of the air forces of New Zealand, Australia, South Korea, the Philippines, Singapore and Thailand also regularly participate. According to its contents, the exercises "Cope Thunder" are similar to the Tactical Air Command's "Red Flag" conducted on the continental USA. Their goal is to work out methods for conducting aerial combat and also solutions for breaking through a strong PVO system and delivering strikes on ground targets during direct air support of the ground troops and interdiction of the region of combat operations.

Its main emphasis is on the questions of training F-15 aircraft crews from the 18th Tactical Fighter Wing (Kadena, Okinawa), which, according to the views of American experts, are universal methods of combat for air superiority and may be used within the entire zone of the command's responsibility in the interests of U.S. Air Force units and the allies for completion by them of the missions of direct air support and interdiction of the regions of combat operations. Subunits of the wing have the mission to deploy rapidly to and simultaneously operate from three to five airbases in the western part of the Pacific Ocean. For this, twice a month, the crews of the 18th Tactical Fighter Wing work out the mission for the transfer flight to other bases in a mode of radio silence, including to Clark AFB for participation in "Cope Thunder" exercises mentioned above. During them, F-15 fighters, usually operating in flights (4 aircraft), train for conducting aerial combat with all fighters arriving there for the exercises, including F-5E's from the "Aggressor" squadron. Its pilots are instructors for conducting aerial combat, specially mastering Soviet fighter tactics. Mainly on the basis of participation in the "Cope Thunder" exercises, PACAF's tactical fighters



complete more than 25 percent of aerial combat training with various types of aircraft.

During the exercises, the crews of F-4, F-16, and A-10 aircraft from the 3rd, 8th, and 51st Tactical Fighter Wings work out the delivery of strikes on ground targets under conditions of a strong PVO system. In them, they utilize on-board cannons, the MAVERICK guided missile, and various aerial bombs, including those with laser guided systems. The specialized aircraft, the F-46 WILD WEASEL, supports the breakthrough of the PVO system. Located ahead of the strike group's combat formation, they expose and destroy the anti-aircraft guided missile complexes along the entire flight path by delivering missile-bomb strikes on them, and also accomplish target designation for other tactical fighters participating in the operation.

The missions solved during the exercises are continuously perfected. For example, in the exercise "Cope Thunder-85/1," besides the usual questions, methods were worked out for anti-partisan operations and air support of the activities of diversion groups. During it, for the first time, tactical aviation completed a large number of sorties for direct air support of the ground troops at night using the infrared target designation system PAVE TACK.

In the process of operational combat training, as noted in the foreign press, the crews of the command complete an average of 13-18 sorties per month.

According to the assessment of the American leadership, the aviation group, created within PACAF, by its composition and present level of combat training completely answers the demands laid to it and is equipped to solve its assigned missions.

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## FOREIGN MILITARY AFFAIRS

### BRITISH AIR DEFENSE CONTROL SYSTEM DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 51-55

[Article by S. Grishulin; "Modernization of Great Britain's Air Defense Control System"]

[Text] Following a course of preparation for aggression against the USSR and the other countries of socialism, and at the same time, developing its offensive forces, the imperialist NATO bloc's military leadership is devoting unabated attention to increasing the effectiveness and expanding the capabilities of its air defense system (PVO). In this vein, at a time when NATO's unified NADGE PVO system in Europe is being modernized, the natural subsystems and equipment which are included as component parts of it are being perfected. One of them is the British PVO's detection and troop and equipment control system given the name UKADGE (United Kingdom Air Defense Ground Environment) by the foreign press.

The task of PVO troop and equipment control within the UKADGE system is assigned to the zonal operations center located in Stanmore, a suburb of London. Subordinate to it are three sectional operations' centers (located in Buchanan, Bowmore and Nitiskhed [Knightshead?] respectively), each having control and warning centers responsible for controlling the combat operations of subordinate subunits of active PVO (air defense missile sites and fighter-interceptors). These centers also include ground warning posts whose main purpose is to receive radar information on enemy air attacks. Depending upon their assigned mission, the posts are outfitted with a variety of radar equipment, including radar for detection of distant and low-flying targets, as well as passive receiving systems for detecting and opposing aircraft involved in active interference, or any combination of these elements. As a rule, these posts do not have direct control of PVO troops and equipment, but only transmit air target data to the control and warning centers.

Communications between the control centers and warning posts are established with the aid of special data transmission channels which include cable and the tropospheric radio relay communication lines of the Ministry of Defense, as well as those of Great Britain's Communications Ministry. In the opinion of English military specialists, the presence of redundant data transmission channels and the use of digital data transmission methods provides reliable

data exchange between any unit and center of the UKADGE PVO control system. It is intended that transmission of information in the future be accomplished by using the so-called data block switching method. It calls for packaging vital radar information into blocks of discreet messages, each of which would have its own address code and the capability of direct entry into a structured data exchange network

The aggregate information on the air situation within the UKADGE system will be presented on display equipment for group and individual use at the PVO zonal operations center. They include analog display devices and alphanumeric indicators which display information on target characteristics and on the radar's operation. Part of the information will be displayed on equipment at the control and warning posts, allowing for receipt of target information and the control of a variety of active PVO equipment.

Judging by Western press announcements, the need to modernize Great Britain's PVO control systems was caused by a number of factors, chief of which was the relatively low tactical-technical ratings of the radars in use. It was believed, for example, that they were not able to provide total radar coverage the country's air space and had little resistance to jamming when the enemy employed various types of interference and when operating while the enemy uses active means of destruction, chiefly anti-radar missiles. In addition, these radar units are basically stationary, therefore, as expected, they can be put out of operation in the early stage of a war with relative ease.

In the 1960s, Great Britain's PVO control system, called Lanceman-Mediator, made use of information from various sources, including detection radar, radar units of the air traffic control system and from SHAKELTON long-range radar aircraft. The capabilities of this system were sharply degraded when searching for low-flying targets. Thus, the ground radar in use provided a detection range of up to 480 km for targets near 18,000 m in altitude, but only 15-10 km for targets at 50-60 m. It was likewise announced that the effectiveness of the system as a whole and of its components did not meet the demands placed on the PVO systems subjected to various types of interference.

In the early 1970s, a special group of NATO specialists analyzed the condition and future needs of Great Britain's PVO troop and equipment control systems. On the basis of the research data, a series of recommendations were made geared toward improving the system and incorporating advance equipment providing the capability to operate under new combat conditions. Taking this into consideration, the Plessey firm, with the participation of the Hughes and Marconi Companies as well, developed and presented for discussion in 1978, a proposal for modernizing the system. The contract to modernize the country's PVO control system, at that time called UKADGE, was let by the British Ministry of Defense in 1980.

During the project, it is specifically stipulated that the necessary radio countermeasures must be attained by utilizing a variety of methods, including use of radar stations operating on various wavelengths (for example, 23 and 10 cm). Thus, in the opinion of English specialists, use of 23 cm radar improves the detection characteristics in the presence of interference from local objects and reflections from hydrometeors [snow, rain], as well as more

effectively protecting the radar station from the effects of active interference, for it is considered that the development of airborne jamming equipment in that frequency range is linked to the difficulty of producing a unit corresponding in size and weight to units operating in the 10-cm band. The intention is to achieve a situation in which the ground radar stations provide the capability to detect air targets with an effective radar cross section corresponding to the size of a bomber at a range of more than 500 km.

During the modernization of the UKADGE system, it is recommended that close attention be paid to improving the survivability of ground radar stations against precision weapons. As noted in the Western press, a radar station can be protected by using various methods of transmitter emission mode control, the use of special signals with little information content, or of special decoy transmitters emitting signals analogous to radiation from the side lobes of a hidden radar's antenna.

One of the prospective methods of significantly improving the effectiveness of the UKADGE system and the survivability of its component radar units is the wide use of mobile and transportable radars, which may rapidly change locations due to their short deployment time. Western specialists believe that in addition to this, such radar stations afford the opportunity to increase radar coverage range and reinforce the detection equipment in more dangerous areas, as well as to replace inoperable stationary radar stations located at radar posts when necessary.

The American GE-592 radar, the Anglo-American AR-320 (Fig. 2), the British Martello S.713 and S.723 (characteristics of these radars are shown in the table) are expected to be the primary detection radar units in the UKADGE system. Great Britain's military experts place their greatest hope in the Martello radar. It is a high-power radar with a flat antenna array which surveys the surrounding area in an elevated plane by forming a cosecant-square radiation pattern for transmission and a fractional 8-ray [pattern] for reception. The horizon is scanned by mechanically rotating the antenna system at a speed of 6 RPM.

In the opinion of British specialists, the Martello radar allows for adaptive modes of operation which, depending upon the type of interference affecting the radar station, provide the capability of switching its subsystems. It is proposed that use also be made of advance methods of radar signal processing and of special equipment for target discrimination against a background of local noise, including digital selection circuits for moving targets and the formation of "noise maps" which should effectively locate targets under complex noise conditions. It is believed that the high level of radiated impulse power, produced by the transmitter in a 3 Mv magnetron, would make it possible to detect small targets at great distances, and that the use of a specially developed antenna array would provide the radar with high resistance to jamming by forming a directional pattern with lower side lobes.

Today, judging by foreign press announcements, a variant of the radar with a solid-state FAR utilizing transceiver modules as active elements is being studied. This radar, designated S.723, will have almost the same tactical-technical characteristics as the Martello radar.

BASIC CHARACTERISTICS OF PROSPECTIVE RADAR STATIONS				
DESIGNATION OR NAME OF RADAR	GE-592	AR-320	S-713 MARTELLO	S-723
Operating Range, km*	350	360	350	390
Impulse Power, kW	24	1200	3000	132
Radiating Signal Wave Length, cm	23	10	23	23
Pulse Duration, ms	50-400	110	10	150
Pulse Repetition Rate, Hz	--	--	200 - 300	--
Beam Width, Azimuth, deg	3.2	1.3	2.8	1.4
Beam Width, Elevation, deg	1.6	1.3	1.5	--
Antenna Type	FAR	FAR	FAR	FAR
Antenna Dimensions				
Width, m	4.2	5.7	6	12.2
Height, m	4.2	5.1	10.5	7.1

\* Having an effective target surface dispersion area of 1 m<sup>2</sup>

In order to increase the effectiveness of air target detection, including low altitude targets in addition to long-range fixed and transportable radar, the UKADGE system is expected to utilize passive direction-finding equipment for active interference platforms as well as low-power radars with FAR operating on the 10-cm band. The latter are called upon to provide an overlap with the system's scanning zones at low altitudes when used as part of advanced warning posts. A variant of this type of station is the unattended radar with cylindrical FAR, which it is recommended be placed on a 20-30-m high tower to provide the capability of detecting low-flying targets in a 360° sector in azimuth and to overlap with the UKADGE system's coverage zone at low altitudes where the effectiveness of long-range radar is degraded.



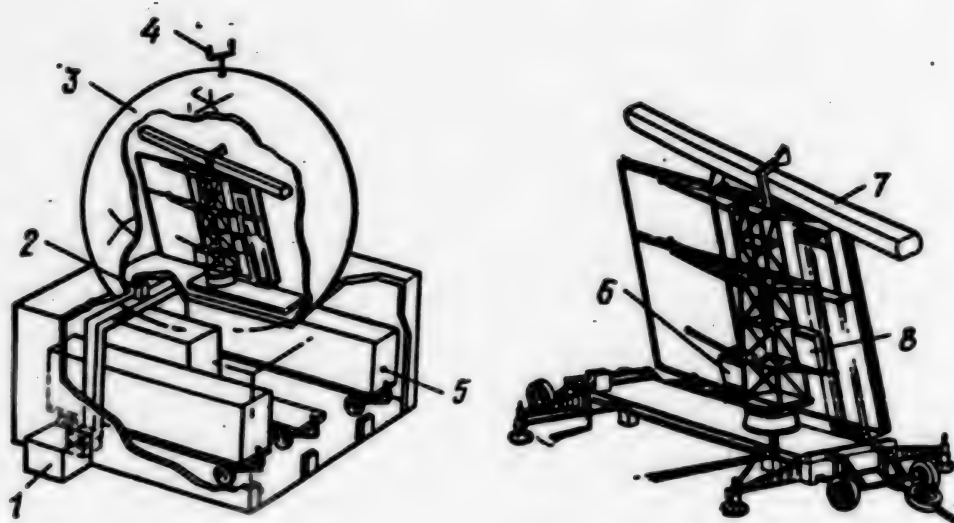


Figure 2. AR320 Radar Variants  
Stationary (on left) and Transportable (on right)

- |                                  |                    |
|----------------------------------|--------------------|
| 1. Air conditioner.              | 2. Air duct.       |
| 3. Antenna housing.              | 4. Signal light.   |
| 5. Radar transmitting equipment. | 6. Heat exchanger. |
| 7. IFF antenna.                  | 8. Damper.         |

Plans call for the wide use of airborne warning and control (AWAC) aircraft, particularly the NIMROD AEW-3, in the UKADGE system in conjunction with data on the air situation received from the ground detection systems as well as information from the air traffic control system to provide more complete coverage in the lower altitudes and to extend the detection range for low-flying targets.

During the modernization of the UKADGE system, special attention is being paid to the interaction of AWACS (NIMROD AEW-3 and SENTRY E-3A) and ground control centers and PVO radar. Integration with the ground equipment will be accomplished with the aid of new LINK-11 interference-resistant data transmission lines, part of the JTIDS (Joint Tactical Information Distribution System). It has been announced that before adopting the special data transmission lines into the British PVO structural control network, their effectiveness will be tested under actual conditions over a period of years.

Plans call for use of special standardized NATO Airborne Early Warning/Ground Integrated Segment (NAEGIS) terminals as terminals to ensure the integration of the air and ground radar detection elements.

The use of new radar operation methods and modes is an important step in the modernization of Great Britain's PVO control system thanks to the further intensive development and improvement of computer equipment and its mathematical support, as well as in communications and data exchange devices. In the opinion of British military specialists, while further modernizing the UKADGE system, this will allow considering the question of using multiple location radar detection methods in order to assure better resistance to jamming and survivability for the radars entering the system. In particular, such methods are expected to be implemented by dispersing transmitting and receiving radar sites and by using independent transmitters and receivers at these sites and exchanging information in real time using broadband communications lines.

The Western press notes that the receiver network of a multiple location system is passive and cannot be detected by radar reconnaissance, thus providing a high degree of survivability. The antenna systems of the receiver network are set up as either reflective or as phased arrays and have the capability of forming multiple horizontal radiation patterns while receiving accurate data on targets by angular coordinates and, in an emergency, they could be used to determine the coordinates of an active jamming transmitter. Regular single-site radar and special transmitters of multiple-site systems can be used to illuminate targets while operating in multiple-site detection mode. Such systems, when subjected to a variety of radio countermeasures and an active means of destruction, can effectively detect air targets.

In the estimation of NATO specialists, after the UKADGE system is updated, it will have more effective means of detecting air attacks and of controlling active PVO defenses through automation of the functional processes of the elements making up the system, allowing for a significant decrease in the number of service personnel. In the process of using this system, it will be possible to exchange data with French and Spanish PVO systems, the air traffic control system, air bases, anti-aircraft missile units and shipboard PVO equipment. The modernization of Great Britain's UKADGE air defense control system should be completed after 1986.

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FOREIGN MILITARY AFFAIRS

U.S. SECOND GENERATION CRUISE MISSILES DISCUSSED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 56-59

[Article by Col V. Kirsanov; "Developing Second Generation Cruise Missiles in the USA"]

[Text] In a bid to tilt in its favor at any price the parity in strategic weapons established toward the end of the 70s, and thereby secure for the United States military supremacy over the Soviet Union, the Reagan Administration undertook, at the beginning of this decade, to carry out a multifaceted program for modernizing the strategic TRIAD, one of whose components, along with land-based and sea-based missile forces, is strategic aviation. According to Western press reports, the primary vehicle for fulfilling [this program] involves upgrading aviation assets by modernizing existing aircraft, designing new models and developing promising offensive systems, first and foremost air-launched cruise missiles.

It was in 1974 that the U.S. embarked on the development of cruise missiles, which were intended for the strategic bomber arsenal. In November, 1981, production of the AGN-86B air-launched cruise missile got underway in Kent (Washington state) at a specially-built Boeing production site. Within a year, the facility reached projected capacity, amassing 40 such missiles every month. Even when completion of the serial production program for the AGN-86B missile seemed to be far in the future, foreign press accounts strongly suggested that virtually from the outset of the operational phase, strategic aviation units had identified very serious deficiencies in the new weaponry. For example, the bulletin AEROSPACE DAILY noted that the accuracy of the cruise missiles was substantially lower than the projected value, mainly because of operational errors in the inertial unit and the radio altimeter. In this context, several American experts recommended a complete halt in the AGM-86B's serial production and favored commencing at once to develop a later generation of more advanced cruise missiles.

During all this, the following arguments were espoused. By the end of the 1980s, as a result of the USSR's developing and deploying the most advanced types of avionic and missile systems, a sharp increase in the effectiveness of existing cruise missiles will occur. This is precisely what THE WASHINGTON POST stated in February 1983, citing the annual reports to the Congress made

by the Secretary and Chief of Staff of the Air Force. Breakthroughs in various fields of "Stealth" technology--making it possible, as it were, to develop "undetectable missiles"--could be expected in the next few years. This would seriously hamper the radar, infrared and optical detection capabilities in an enemy's air defense system. And, finally, certain accomplishments in producing new kinds of small-sized jet engines with greater thrust and decreased fuel consumption, would increase the missile's effective range by no less than 1.5-2 fold.

In the beginning of 1983, the Pentagon, taking these and other factors into account, formulated a tactical-systems project, in which the leading U.S. aerospace corporations were invited to examine the possibility of developing a second generation of cruise missiles and to present their findings for review by the Air Force's Weapon Systems Development Command. After examining the projects elaborated by Boeing, Lockheed and General Dynamics, Air Force specialists endorsed the latter's proposal as the most viable and interesting. Within this context, in April, 1983, General Dynamics was awarded a contract to proceed with the full-fledged development of a new cruise missile given the conditional designation ACM (Advanced Cruise Missile).

Citing statements by senior Pentagon officials, the Western press reported that the primary efforts in developing the missile will be focused on increasing its effective range and enhancing its survivability by drawing extensively upon the achievements made in "Stealth" technology. Expanding upon these announcements, the American bulletin AEROSPACE DAILY noted that the U.S. Air Force has operational requirements for the ACM to surpass the AGM-86B cruise missile, not only in range and speed but also in accuracy, maneuverability and functional reliability.

At the present time, according to foreign press accounts, development of the ACM is proceeding as planned. American specialists intend to increase the flight range and speed in the near term by equipping it with a new engine. Its design was undertaken in the summer of 1982 by Williams International, which was awarded nearly 65 million dollars by the Air Force to pursue that effort. A number of changes, introduced into the structure of the F107-WR-101 engine, which was installed in the AGM-86B missile, made it possible to develop a more efficient engine, the F107-WR-103. Reports noted, in particular, that, by comparison with the previous model, it has 40 per cent more thrust and a net fuel consumption that is 5 per cent less. Its further development gave rise to yet another version, designated F112-WR-100. It is this fundamentally-new turbofan engine, serial production of which is projected to start in 1987, which, in the view of U.S. Air Force specialists, will provide the missile a flight range of up to 4,200 km. The foreign press focuses attention on the extremely high reliability of this engine, which makes it possible to establish a planned maintenance schedule and servicing cycle once every five years rather than the once-in-three-year schedule required for the F107-WR-101.

With an eye toward more long-range plans, the U.S. has conducted broad-based research into developing fundamentally new and even more efficient engines. Thus, the American bulletin DEFENSE WEEKLY wrote that promising types of cruise missiles will be equipped with regenerative-type turbojet or turbofan



engines in which a portion of the thermal energy of the exhaust gases will be recycled to the engine through a special heat exchanger. This will substantially increase the efficiency of fuel combustion and thereby provide additional flight range. It is emphasized that while the idea itself is not new, its technical realization has been hampered by problems associated with developing an adequately reliable light-weight, small-scale heat exchanger. Specialists plan to solve the problem of developing such heat exchangers by drawing extensively on ceramic materials.

Another specific area of inquiry involves developing so-called compound ducted-fan engines and engines with eccentric compressor or turbine configuration. In the case of the first type of engine, which has a high degree of ducting, the compressor is driven by a high-speed diesel (up to 8,000 rpm). As to the second type of engine, the compressor's final stage, the combustion chamber and the turbine are installed at a certain angle (or parallel) to the axis of the first stages. The journal FLIGHT has noted that the turbine blades in the experimental model of this type of engine were made of heat-resistant alloys containing niobium. This made it possible to test it at an operating temperature on the order of 1,400<sup>0</sup> C. Preliminary evaluations show that these engine have a reduced net fuel consumption and increased thrust.

In tandem with developing such structurally unusual engines, research in the United States is focusing on new types of fuel with greater heat-generating properties than those of JP-9 and JP-10, which are now used in the engines of present-generation cruise missiles. Furthermore, new types of fuel will have greater density. This will bring about a decrease in the missile's overall weight and an extension of its flight range.

The development of radically-new types of engine also envisages structural uses of materials not commonly employed in missile production and capable of withstanding high temperature levels for extended periods of time. For example, the journal INTERAVIA wrote that the U.S. is researching several kinds of materials which fully retain their properties at temperatures up to 3,500<sup>0</sup> C. It is anticipated that they will be used to produce turbines for promising types of jet engines. In particular, it has been reported that the most encouraging results have come from research into ceramic and carbon-composite materials.

The latter will also be used to make structural components of the housing and the aerodynamic surfaces of the cruise missile. American experts claim that this will substantially reduce the effective radar cross section and weight and, as a consequence, increase the flight range. Practical applications of carbon-composite materials as components of the space shuttle's heat-protection shield give reason to assume that cruise missiles, as DEFENSE WEEKLY points out, very well may fly even at supersonic speeds.

Research into possible applications of composite materials is only one aspect of wide-range efforts which the U.S. has termed the "Stealth" program. According to Western press reports, ventures undertaken in this context are intended to reduce the general identification features of all types of airborne systems--planes, helicopters and missiles. As part of the program,

special measures are being developed to hamper detection of cruise missiles by air defense electronic devices. For example, to shield the missile, consideration is being given to using radio-absorbing coatings, changing the shape and configuration of the air intake and ensuring a reduced temperature level for the exhaust gases. In addition, efforts are underway to devise a series of measures which will decrease missiles' noise levels and their electromagnetic and heat radiation. Thought is also being given to ways of substantially increasing the smoothness of the body and wing surfaces. It is believed that by accomplishing all of these efforts, the effective radar cross section of the ACM missile will decrease by almost an order of magnitude as compared with that of the AGM-86B cruise missile.

The increase in the cruise missile's flight range is accompanied by a sharp rise in requirements placed upon the guidance systems that are installed in it. In evaluating the capabilities of the guidance system found in existing cruise missiles, the journal INTERAVIA noted that it is not an optimal system that is suitable for use in promising cruise missiles with intended flight ranges. This is because it poses serious difficulties in isolating errors within the inertial unit caused by gyroscope "precession," resulting in missile deviation from the planned trajectory by as much as 900 meters during one hour of flight time. Furthermore, this kind of system lacks the capability to redirect the missile after it has been fired from an airborne launcher. This significantly limits its flexibility in terms of combat application. In this context, U.S. Air Force specialists are studying the question of developing more advanced inertial systems and requisite speed vector measuring devices which will employ doppler lasers with a 10.6 mkm wave length.

Much attention is also being given to research into the prospects of using the NAVSTAR system to guide the ACM missile to its target. By using its signals, the onboard system, according to American specialists, will be able to determine, at preset time intervals, the cruise missile's spatial position with a level of error not exceeding 18 m and its speed with an accuracy of up to 0.1 m/sec. To achieve the optimal flight trajectory, the cruise missile's onboard computer is being furnished with an array of complex programs, allowing for automatic assessment of danger levels expressed as a function of the magnitude and direction of the enemy's ground radar pulses. By comparing the pulses from various radars, the onboard computer will select the missile's safest and optimal flight path to the target, while also considering the amount of fuel remaining onboard.

As a radical solution to the question of the cruise missile's target accuracy, American experts suggest using an autonomous guidance system on the final leg of the flight trajectory. This kind of system must contain sensors operating in the infrared and optical wave band which will enable it automatically to compare the factual image obtained by them [the sensors] with the data about [the image] stored in the onboard computer memory. The assumption is that the information entering the computer will permit not only target identification and missile guidance to targets, but also assessments, as required, of damage levels caused by detonating other kinds of munitions. At the same time, the ground will be laid for developing an automated system capable of redirecting cruise missiles to targets still intact. In general, the guidance system being developed for second-generation cruise missiles has to be a multi-

channel and highly accurate one, which can function during any weather conditions and at extremely low altitudes. According to reports in AEROSPACE DAILY, cruise missiles equipped with such a system, whether in a nuclear or conventional mode, will be able to strike effectively at both fixed and moving targets.

At the same time that it embarked on the development of second-generation cruise missiles, the U.S. Air Force command re-evaluated the program for serial production of AGN-86B missiles. In particular, instead of producing 4,300 missiles of this type, plans call for making only 1,715 units and completing their deployment within components of the Strategic Air Command by the end of 1986. As part of this effort, an accelerated development cycle is envisaged for the ACM cruise missile so as to begin flight tests on experimental models in 1986, commence serial production in 1987-8, and produce 1,300-1,500 second-generation cruise missiles within a few years thereafter. Overall expenses, including research and development, test and evaluation and serial production costs to the ACM missile are expected to reach some 6 billion dollars.

Pentagon strategists estimate that, as a result of these programs, the United States will be able to have 3,000-3,200 air-launched cruise missiles by the middle of the 1990s. Some 50 percent of these will be second-generation ACMs. In their view, equipping B-52 bombers and then the B-1B and ATBs with these cruise missiles will increase the U.S.'s ability to conduct its policy of acting "from a position of strength." However, as the experience of recent decades indicates, all such attempts have usually marked only the start of another spiral in the arms race since the USSR cannot but consider the threat to its security arising from these efforts and cannot but undertake appropriate countermeasures.

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## FOREIGN MILITARY AFFAIRS

### PROVISION OF INTELLIGENCE INFORMATION TO THE U.S. NAVY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 68-72

[Article by Capt 1st Rank B. Tyulpakov; "Providing the U.S. Navy with Intelligence Information"]

[Text] Hiding behind the myth of "the Soviet threat", ruling circles of the United States are racing headlong to achieve military superiority over the Soviet Union. To achieve their aggressive plans, they have assigned a special role to the navy which they consider capable of executing a wide range of tasks both in general nuclear war and in conventional conflict.

The naval construction program, and other practical measures taken in recent years by the politico-military leadership in the U.S., demonstrate clearly that superiority in the maritime theaters (TVD) is a permanent feature of U.S. military strategy. In connection with this, a build-up of naval surface groups, with increased striking power, is being speeded up in key regions of the world. Ships, submarines and aircraft are being equipped with new missile capabilities, including long range nuclear cruise missiles. To enhance the fleets' military capability and to support strike forces at sea, regional systems of over-the-horizon targeting are being developed.

At the same time, a system of intelligence support for forces at sea and methods of reconnaissance and surveillance of the surface and subsurface situation are being developed and perfected. In this area, special attention is being given to space and airborne surveillance systems and long range hydroacoustic submarine detection systems which, in the view of U.S. Navy headquarters, based on the Ocean Surveillance Information System (OSIS), will allow constant control, even in peacetime, of broad ocean areas and will guarantee a first strike capability at the onset of hostilities.

OSIS is a navy automated information system which furnishes intelligence information to the naval headquarters and the operating fleets in near real time. It came into being in 1979, and consists of a main naval information center located in the U.S. and several regional centers situated in various areas of the globe. OSIS collects, processes, modifies, stores and updates intelligence information collected from space and airborne surveillance



systems, shore-based signals intelligence sites, ships at sea as well as the long range, fixed, passive hydroacoustic surveillance system, SOSUS.

**OCEAN SURVEILLANCE SATELLITES.** Naval forces have utilized information from various satellites for over 20 years. In the view of naval leaders, space science has made possible, in principle, new means of surveillance, capable of tracking battle groups, detecting aircraft and guided missiles in real time, and performing missile targeting.

Creation of an actual space reconnaissance and surveillance capability in the navy began at the end of the 1960s. Two space surveillance projects were developed. The first, known as WHITE CLOUD, envisioned the creation of an operational space system of radar (electronic) reconnaissance (RTR) -- the second, CLIPPER BOW, was a reconnaissance satellite carrying a space-based radar (RKB).

In 1976, WHITE CLOUD produced the first operational launch of an RTR orbital group, consisting of a primary Naval Ocean Surveillance Satellite (NOSS) and three secondary satellites placed in orbit at several tens of kilometers distance to create a direction finding baseline. Subsequent launches of similar systems took place in 1977, 1980, and 1983 (the latter with the objective of changing the orbital configuration of the 1976 launch). Launch of the third system in 1980, concluded the building program of a naval space radar reconnaissance system. All systems conduct surveillance autonomously and perform intercept of radar emissions from ships, submarines and aircraft. They also locate the coordinates of surface units with great accuracy through interferometry methods of radio direction finding (RDF). Surveillance information from each RTR satellite grouping is transmitted in real time using communications channels from the satellites to ground receiving centers.

Planning and execution of surveillance operations from space was assigned to the U.S. Navy's Space Command, established at the end of 1983. Judging from information in the foreign press, development of radar reconnaissance satellites is still in the research and evaluation phase even after about ten years. Research is ongoing for effective space methods of detecting and tracking small-size, fast-moving targets against a ground or sea surface background..

Western specialists consider that the problem of surveillance of fast-moving targets (aircraft, cruise and ballistic missiles) might, to a certain degree, be resolved by deploying low-orbiting, large-size (over 100 m in size) radar satellites with multi-beam phased-antenna arrays with independent beam guidance and electronic sector scan.

The potential use of infrared and microwave techniques for space surveillance of fast-moving targets is also being examined. Among the means of IR surveillance for detecting targets in flight is the hypothetical use of a mosaic-like receiver, operating in the mid-range of the IR spectrum, made up of several hundred thousand sensitive elements. Information could be processed on board with computer-assist and the image then transmitted to earth. In an ultimate configuration, the receiver would be fitted with special tunable filters operating in various areas of the IR spectrum.

U.S. Navy specialists have designed several types of microwave systems (with ranges from 10-90 GHz) designated especially for use on the NROSS (Navy Remote Sensing Ocean Surveillance Satellite) to determine the state of the ocean surface. They are studying the possibility of developing a large-size antenna array of approximately 2,000 m<sup>2</sup> area, made up of several thousand receivers in the millimeter wave range to detect and track aircraft, anti-ship missiles and cruise missiles. Hypothetically, in the long term, microwave radiometric equipment will have fan-shaped directional wave diagrams whose frequency would shift according to a programmed set of tasks.

The navy is currently looking at creating ITSS (Integrated Tactical Surveillance System), a complex system of tactical surveillance satellites for radar reconnaissance of maritime areas. This research is directed primarily toward a search for effective passive and active space reconnaissance measures against airborne targets. Conceptual effort is ongoing in hopes of determining space-based radar construction type, working frequency, radiated power, power sources, quantities (number of satellites), as well as ease of satellite release, reliability of communications, and degree of stability against electromagnetic pulse and interference. The foreign press reports that the navy is looking into a system of six low-orbiting satellites equipped with RKBs. At the same time, they are examining whether or not to install on the satellite mosaic IR receivers for surveillance of fast-moving targets.

Airborne reconnaissance will remain, in the navy headquarters' eyes, the most effective means in the near term of conducting reconnaissance of the military activities of carrier and surface ASW groups and understanding the operational situation in the maritime coastal regions. The navy believes that despite successful development of space based radar satellites, airborne reconnaissance will not lose its value.

The U.S. Navy is currently paying particular attention to development and improvement of airborne means for long range detection and tracking of air and surface targets as well as radar reconnaissance and targeting of antiship missile carriers. The overriding reason for this seems to be the growing capability of shipborne AAW, which makes visual and photo intelligence considerably more difficult. According to foreign press reports, there are about 200 reconnaissance aircraft, both land and sea based, in the U.S. Navy. For airborne reconnaissance they employ special photo equipment, side-looking radars, ELINT and electro-optical systems.

Reconnaissance of maritime and coastal regions is normally conducted by EA-3B and EP-3E land-based aircraft. The former are equipped with the AN/ALR-90 ELINT system, side-looking radar, and television equipment. The EP-3E is equipped only with the AN/ALQ-110 ELINT system, [for use] against ship and land-based radars, an AN/ALQ-60 radio intercept position, an AN/ALD-8 radio direction finder, and an AN/AAR-37 TV receiver. The onboard system, driven by an AN/ASQ-114 central computer processing unit, automatically conducts search, intercept, DF and analysis of radar signals and fleet and satellite communications. The aircraft is further equipped to process the data and transmit them to fleet intelligence information centers and battle groups in real time on ATDS and joint tactical intelligence systems. The crew is

comprised of 15 radio and ELINT operators. There are 12 such airplanes in naval aviation.

The basic sea based reconnaissance aircraft is the RF-14A (replacing the RF-8G). Plans call for no less than 50 of these aircraft. Research has been underway to determine if the TR-1 (designed after the strategic reconnaissance airplane, U-2R) can be used as a new American sea-based high altitude reconnaissance aircraft. During these trials, the TR-1 demonstrated the capability to conduct maritime reconnaissance, as well as to perform over-the-horizon targeting.

At the present time, the F-18 is also being studied in a reconnaissance role. In the U.S. Marine Corps, the RF-4B aircraft, which is equipped with SLAR, ELINT and IR equipment, is used for reconnaissance missions.

Land-based patrol aircraft and sea-based ASW aircraft and helicopters have various means, including ELINT, of detecting and tracking submarines. Accordingly, the P-3C ORION carries the AN/ALQ-78 to detect submarine radars, to measure their characteristics automatically and classify their signals. The AN/ALQ-78 locates the direction and automatically locks on the signal source.

New airborne ELINT systems are now in design and old ones are being modernized. They have a high level of technical characteristics: frequency range of 1-18 GHz, accuracy in frequency determination of 1-5 MHz, sensitivity of 80-90 dbm and ability to detect, process and DF signal in less than one second.

The U.S. Navy is also examining different ways to encapsulate reconnaissance equipment for strike aircraft (primarily fighters). For the sea-based F-14, the Navy has ordered the design and production of three "pods" of reconnaissance equipment, to include photographic, IR and TV capabilities. On the radar warning (DRLO) and guidance aircraft, E-2C, in addition to the long-range detection radar, there is an AN/ALR-59(V) electronic reconnaissance set which permits constant tracking of the electronic situation, without giving oneself away, and target identification by their radar emissions at ranges of 1 1/2 to 2 times greater than the radar range at which the enemy could detect the aircraft. The AN/ALR-59(V) has an automated four-band receiver (frequency range .5-18 GHz) and a DF element with improved bearing accuracy achieved through the simultaneous use of phased interferometer and signal amplitude comparison techniques. The system is computer-driven. Independent parallel scan of the frequency bands is also envisioned.

In order to enhance security and jam-proof capacity of the DRLO's radar tracking of small air and surface targets, the Navy's program COVERT STRIKE is examining the possible use of bistatic radar techniques. In this technique, radar emissions of the DRLO aircraft or special high-flyers, reflected off the target, are received by nuclear weapons carriers, allowing them to track targets, without revealing themselves by turning on their own radars. This method, it is pointed out, could have application in the STEALTH program.



HYDROACOUSTIC METHODS of observing the underwater situation play a leading role in the system of intelligence dissemination to ASW forces. Special attention is given to the development and improvement of long range hydroacoustic submarine detection. In this instance, as in the case of space reconnaissance, the following problems prevail: control of the ocean depths, detection of enemy submarines, tracking them in real time and pinpointing their location with a high degree of accuracy.

To keep track of the underseas situation and for long range submarine detection and tracking, the U.S. Navy is using, developing and improving shore-based (fixed), deployable (anchored in specified areas by aircraft and ships) and movable (used by specially-constructed ships) hydroacoustic sonar systems (GAS). The shore-based sonar system is the principle element of sonar surveillance. The first such systems were designed under the CAESAR program, and was placed in service in the late 50s. The rapid development and an intense expansion of shore-based acoustic systems in the sea and ocean theaters allowed the navy to build the SOSUS fixed passive system of long range acoustic surveillance.

Shore-based systems are comprised of a hydroacoustic array (hydrophones), which, depending on the depth and bottom contour, stretch out into the sea from several tens to hundreds of kilometers; a shore station; and underwater cables connecting the array to the station. The system contains distributed elements to amplify and process acoustic signals, high speed spectral analyzers and a computer, to ensure detection, localization, classification and tracking of acoustic targets in near real time. Intelligence is transmitted to fleet ASW centers as well as OSIS information centers.

Sonar systems are placed in the maritime TVD's with regard to their military-geographic peculiarities, possible areas of enemy submarine deployment and operations. They are placed as well in consideration for depth and bottom contour, where there are continuous detection zones of considerable extent and boundaries and where straits and narrows overlap.

Foreign press sources note that creation of detection zones by shore-based sonar systems covering large oceanic regions is an exceptionally complicated matter because of the presence of great depths, and the absence of the continental shelf and natural narrows, impeding deployment of hydrophones and shore stations. In this connection, the U.S. Navy, at the same time as the shore-based system modernization, is developing deployable and maneuverable long range sonar detection systems in the RDSS (Rapid Deployment Surveillancewe System) and the SURTASS (Surveillance Towed Array Sensor System) programs.

RDSS is a rapidly expanding deployable system for long range detection under development, which uses anchored sonobouys (RGB) of about 3 m in length which must be dropped from the P-3C and S-3A aircraft or placed by submarines. The bouy is designed to work in the near-bottom zone, where the best conditions for long range acoustic propagation prevail. The bouy contains a mini-computer for preliminary analysis of signals as they are received, and a transmitter by which information is sent to shore stations for further processing. Both ships and ASW aircraft can use the bouy. RDSS is designed for use in localizing more accurately submarines detected by SOSUS, or for



surveillance in those regions of the oceans where SOSUS is less effective as well as for rapid and secure deployment in areas where there is a requirement to control submarine egress. Final evolution of the system is expected at the end of the 1980s.

In the SURTASS program, a special T-GOS-Class of ships is being built. The T-AGOS is equipped with a towed sonar hydrophone array for long range sonar detection. It is regarded as supplementary to shore sites. Foreign media reports state that 12 ships will be constructed; the lead ship STALWART, was launched in 1983.

The Western press emphasizes that RDSS will play a leading, significant role in the ASW battle. It enjoys high endurance and will operate effectively should SOSUS and its supplementary T-AGOS ships become disabled.

From the end of the 1970s, efforts tied to development and perfection of long range acoustic surveillance entered a new phase. According to US politico-military leadership announcements, the main problem at this stage is development of an effective system of intelligence delivery to ASW forces in real time. To solve this problem, beginning in 1976, machine methods of central processing of acoustic signals, coming in from various sources, were developed. The goal is classification and creation of a data bank of noise characteristics of submarines, increasing the accuracy of determining location, character and elements of their movement.

The foreign media note that the navy has completed construction at the Naval Air Station, Moffet Field, California, of a computer complex for processing acoustic data, the heart of which is the powerful ILLIAC-4 computer. According to data received from the system for forecasting hydrometeorologic conditions, ASWEPS, (in the long term, from the NROSS satellite), and from the AMER system (Translator note: should be AMVER), an actual listing of information on merchant shipping (in order to eliminate false targets), own forces and acoustic information from shore stations and from ASW forces, the ILLIAC-4 will conduct analysis, matchups of received signals with standards stored in memory, and will produce a probability of assessing whether a signal originates from a submarine. It is reported that the ILLIAC computer provides a sharp increase in effectiveness in detection and tracking of submarines in comparison with existing means. The Navy plans to construct several centers which will use analog computers. The FLTSATCOM satellite system will furnish a communications path between centers, shore acoustic stations and ASW defense forces.

SHIPBOARD SURVEILLANCE METHODS utilize in the main the same detection system for air and surface situations as for ASW. In surface ships and submarines the means of surveillance are predominantly radio and radar. As foreign specialists report, the use of electronic reconnaissance on ships increases their security, reduces the probability of a sudden strike and ensures a greater target detection range compared with other means of surveillance and observation available to the ship. For the last ten years, several types of multi-target packages and electronic surveillance systems have been designed (AN/WLR-6, 8, 11, 21, AN/SLR-21) as well as RDF equipments. The most modern of these systems is the AN/WLR-8 (in a number of modifications) used on ships

of basic classes and on submarines. An electronic reconnaissance system has also been designed, the AN/WSQ-4, SEA NYMPH. It is intended as a replacement for the AN/WLR-6 on submarines. It is planned to install the automated SEA NYMPH on LOS ANGELES-class submarines. A new RDF, AN/BLD-1, has been designed for these units.

For installation on surface ships of various classes, the fleet has developed a system of radio and electronic surveillance, the AN/SSQ-72, consisting of the detection and intercept station AN/SLR-16 and the RDF, AN/SRD-19, installed on cruisers, frigates and destroyers. The system is designed for surveillance support to a multitarget carrier group. The built-in synchronized guidance of the ship's RDF allows it to specify the position of a target of interest and track its movements.

Shipborne electronic reconnaissance systems, in addition, are designated for detection of radar and radio navigation signals from air and ship antiship missiles and to give off warning alarms. The majority of these practically instantaneously specify frequency, bearing and with the aid of a computer, identify the type of radar by beam parameters. Reaction time of such systems in detecting the navigation and radar signals by fire control is about 1 second and by search radar, 2 antenna revolutions.

SHORE-BASED SURVEILLANCE is comprised in the main of fixed radio reconnaissance sites, which employ large diameter, circular antenna arrays to search omnidirectionally for forces at sea by means of intercept and DF of their shortwave (KV) fleet communications. The preferred system in use for carrying out radio intercept and direction finding is the RDF antenna system, AN/FLR-15.

In a general outline, these are the compositions and basic directions of force development and improvement of surveillance support to the U.S. naval forces.

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## FOREIGN MILITARY AFFAIRS

### FRENCH NUCLEAR BUILD-UP DISCUSSED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) p 75

[Article by Col E. Zorin; "The Build-up of French Nuclear Potential"]

[Text] The French National Assembly approved the country's 1985 national budget, of which 16.6 percent (151.5 billion francs) was allocated to the Ministry of Defense. By Western observers' estimate, the distinguishing feature of this year's military budget is that the lion's share--33 per cent is designated for a further build up of the country's nuclear potential.

Development of the ADES tactical mobile guided missile, with a nuclear warhead, intended as a replacement for the PLUTON guided missile in the ground forces is continuing. Six hundred fifty million francs have been appropriated this year for this program.

Work is planned for the further hardening the medium-range S-3 ballistic missile silos against the influence of electromagnetic impulse and nuclear detonation shock waves.

Resources have been ear-marked for purchasing the first 16 MIRAGE-2000 aircraft. They will be equipped with ASMP medium-range air-to-ground guided missiles with nuclear warheads. The modernization of 11 MIRAGE-4 medium strategic bombers with externally-carried ASMP guided missiles is contemplated (7 of them have been reequipped already). The first squadron of these aircraft is scheduled to enter the air force in 1987.

In naval aviation, part of the SUPER ENTANDARD carrier aircraft is being refitted also to carry the ASMP guided missile (flight tests of the first model have begun already).

As noted in the foreign media, in April of this year, the PLARB (SSBN) INFLEXIBLE, armed with 16 M4 ballistic missiles with multiple warheads, entered service--the 6th SSBN in the French fleet. The first five are presently equipped with M20 missiles with single warheads. The rearmament of four SSBNs (except REDOUBTABLE) with M4 missiles is envisioned.

In the 1985 military budget, 1,552 million francs are allocated for developing a new generation of SSBNs for the 1990s. The order for the construction of the lead submarine is scheduled to be placed in 1987. Its construction, according to NATO experts' calculation, will take from 3-5 years.

In 1985, France's military budget, as acknowledged by Charles (??????), the defense minister, will grow, in real value, by 7.66 percent.

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BMEWS IMPROVEMENT DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) pp 76-77

[Article by Lt Col V. Pavlov; "BMEWS System Improvement"]

[Text] Judging by the announcements in the Western media, the U.S. is contemplating starting work, in the next few years, on improving the BMEWS system. The system is designed for detecting and tracking intercontinental ballistic missiles and also submarine-launched ballistic missiles. In the first stage it is envisaged essentially to improve the mathematical control of the algorithms of the functioning of all three of the radar posts (RLP) which input to the system. They are deployed in Thule (Greenland), (Great Britain), and Clear (State of Alaska). To achieve this, it is planned to replace the obsolete electronic computing equipment, made up of the IBM 7090 computer, with the next generation of computers, the CDC 170-865, Modcomp 2/75, and the CDC 2551-3.

In the second stage, the construction of a new radar station, with a phased antenna grid in the RLP, will begin in Thule. Ratheon, with whom an 80 million dollar contract has been concluded, will be the general contractor. They intend to mount the radar on the roof of the 4-storey building, built several years ago for the AN/FPS-49 tracking radar. The new radar, as American specialists announce, by its construction and main technical characteristics will be similar to the PAVE PAWS radar except for the FAR aperture, the diameter of which is nearly 25 m. It is planned to place 3,584 elements in the area of the antenna grid and 2,500 of them will be active, i.e., connected directly to the transmission module (each will produce an output impulse of about 300 W of power).

It is considered that the presence in the radar of two identical FARs will allow conducting a sweep of a 240° sector in azimuth rather than the 160° which is being provided by the four AN/FPS-50 radars. Data from this RLP will be transmitted directly to the command posts of the U.S. Strategic Air Command and the headquarters of the North American Continent Air and Space Defense Command (NORAD). The radar at the Thule site is scheduled to begin operation in October 1986. After work is completed, it is intended to replace the station in the RLP at Fylingdales Moor, however, the final selection of its type has not yet been made.

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BRITISH BATTLEFIELD SMOKE GENERATOR DESCRIBED

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) p 77

[Article by Col E. Viktorov; "English Tank Smoke Device"]

[Text] Judging by the foreign media information, the VIRSS (Visual and Infra-Red Smoke Screening System), an on-board smoke grenade launching device, has been developed in Great Britain for camouflage improvment and reducing the vulnerability of main battle tanks and other armored vehicles on the battlefield. It is intended for creating interference both in the visual and the infra-red (IR) ranges with various means of enemy observation and fire control.

An experimental model of the device is presently undergoing tests on the new British CHALLENGER tank. The system includes 12 units, made of strong plastic. The dimensions of each unit is 160 x 130 x 135 mm and weighs about 12 kg. In it there are 20 grenade launching tubes (4 rows of 5 each). The units are mounted on the front part of the vehicle to the left and right of the cannon. In the system, arranged on the tank turret, there is also a firecontrol keyboard console and an electric generator which generates direct current for supplying the circuits for igniting the grenade launch charges.

To produce a camouflage smoke screen, grenades are launched singly at short intervals. An improved effectiveness of the [smoke] screen, in the English specialists' opinion, is achieved when the grenades detonate, not on the ground but in the air 25 m in front of the tank and in a sufficiently wide sector. From the beginning of the formation of the [smoke] screen up to its dissipation (approximately 15 sec), as a result of the successive detonation of a large number of granades directly in it, there is a region of high temperature, thanks to which thermal interference is created and the effectiveness of the use of enemy IR equipment, including tank IR imagers, is significantly reduced. A camouflage [smoke] screen can be produced during the movement of a tank in different directions with respect to its course.

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FOREIGN MILITARY AFFAIRS

SHIPBOARD COMMUNICATIONS COMMAND AND CONTROL EQUIPMENT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 5, May 85 (signed to press 11 May 85) p 78

[Article by Capt 1st Rank N. Starov; "Shipboard communications control and monitoring equipment"]

[Text] According to foreign press announcements, the British firm MARCONI is supplying H6701 equipment to the country's navy to remotely control and monitoring the operation of shipboard radio communications equipment in corvettes, cutters and submarines. It comprises a central panel with a switching unit; remote devices mounted next to the users' terminal equipment; 16 subscriber lines, which are connected to the central panel; and as many connecting it to the radio equipment. The H6701 is capable of serving up to 16 subscribers and, with an increase in their number (up to as many as 32), 2 central panels are used jointly.

Commands for linking subscribers to the necessary radio communications equipment are given by a pushbutton switch. Linking a subscriber line with the lines running to the transmitters (receivers) and, when necessary, their rapid switching, is accomplished by a switch with a temporary multiplexing of signals, which ensures each subscriber's line a transmission and receiver line in the telephone mode, transmission of control signals by a transmitter and the receipt of information signals concerning the receiver operating mode. A set of indicators on the central panel displays the execution of the operation.

The option of joining (subscriber--radio equipment) and the level of transmitter radiated power in kW, and also the tuning of the transceiver to the frequency are centrally carried out. The output stages of the four transmitters are aligned on six previously-selected values of radiating power, and their magnitudes are displayed on a digital indicator. The frequency channel (the working frequency) and the mode of operation are chosen by the remote operator.

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